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XXXII.—*The Ornithology of Formosa, or Taiwan.*

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[Concluded from p. 311.]

82. Alauda cœlivox, Swinhoe.

Throughout the plains, the downs, the grassy plateaux, wherever the locality is suitable in Formosa, this little Lark is found, delighting the ear of the savage, the colonist, and the adventurer alike with its sweet song as it disappears into the sky. But it often also sings on the ground, or mounted on some stone or prominence. In the Pescadore Islands, between Formosa and the main, it is also very common, and almost the only bird there. It is abundant in the south of China, from Canton to Foochow. In Shanghai it is replaced by a similar form, but intermediate in size and proportions between it and the so-called *A. arvensis* of Peking and its neighbourhood. In my large series of skins from Formosa there is considerable variation in the length and thickness of the bill, some, in the bulkiness of that organ, drawing close to the *Mirafræ* of Africa and India. For a more detailed account of this bird I must refer my readers to the 'Zoologist.'

83. Emberiza spodocephala, Pall.

E. melanops, Blyth.

Euspiza personata of my Amoy List, Ibis, 1860, p. 62.

These Buntings visit Formosa in winter in large numbers. They are identical with those procured at Amoy, and are refer-

able to the Siberian species described by Pallas, with the greyish olive throat and breast, and black ring round the bill, in mature plumage.

84. Emberiza sulphurata, Schleg.

This is also a winter visitant, but by no means so common as the last.

85. Emberiza aureola, Pall.
86. Emberiza fucata, Pall.
87. Emberiza cioides, Temm.

Winter visitants; not common.

88. Fringilla sinica, L.

A resident species; somewhat rare. Its nest and eggs are not unlike those of the Goldfinch (*Carduelis elegans*).

89. Passer montanus, L.

The prevailing House-Sparrow, as in China. Its eggs are very variable, even in the same nest, as to colour, size, and shape.

90. Passer russatus, Temm. & Schleg. Faun. Japon. p. 90, pl. 50.

Specimens received from the hills. Bill black; legs yellowish brown, with brown claws. These birds from Formosa are identical with skins from Japan in Capt. Blakiston's collection, and with others from Canton in mine. I was some time under the impression that the Russet Sparrow of Japan was identical with *P. cinnamomeus*, Gould, from the Himalayas; but, on referring to the British Museum, I find that the Cinnamon Sparrow, as well as a closely allied species, *P. flaveolus*, Blyth, have the under parts yellow, whereas those parts in our bird are whitish. I have no longer any doubts as to the distinctness of the species. This bird has rather a wide distribution in Eastern Asia, extending throughout the hilly parts of China, from Canton to Shanghai, and perhaps further north. It occurs, as we can testify, in the hilly parts of Formosa, and most probably throughout the Japanese islands, as we have seen it from two extreme parts, Nagasaki and Hakodadi. In places where it occurs, it is a shy bird, frequenting retired spots on the woody hills, and nesting in holes of trees. In fact, as regards its

habits it may be called the Tree-Sparrow of Eastern Asia, the true Tree-Sparrow (*P. montanus*, L.) of Europe having there usurped the position of the House-Sparrow (*P. domesticus*), which does not occur.

♂. Upper parts bright cinnamon-red, with a few long black spots on the back. Under parts smoke-grey, whitish on the cheeks, and ochreous on the belly and vent. Throat black, as also space between the eye and bill; a thin streak of white runs from the bill over the eye. Lesser wing-coverts white; greater coverts and tertiaries black, with reddish-white tips and margins; quills dark brown, edged with reddish white, more deeply on the basal exterior of some of the primaries, where it forms a bar. Tail and its coverts brown, tinged with olive, their margins being light.

Length $5\frac{2}{8}$ in.; wing $2\frac{6}{8}$; tail $1\frac{7}{8}$; expanse $8\frac{2}{8}$. Legs pale flesh-brown, tinged with yellow, especially on the soles. Bill black. Iris deep blackish brown. Gizzard round and muscular, about $\frac{1}{2}$ inch in diameter, flattened; epithelium well furrowed and yellow. Intestines 7 in. long; the cæca situate about $\frac{1}{2}$ in. from anus and $\frac{1}{10}$ long.

The female of this species I was not successful in procuring either from China or Formosa; but, from specimens in the Leyden Museum from Japan, I observe that it differs considerably from the male in a manner analogous to that which obtains in *P. domesticus*. I believe *P. montanus* stands alone in the peculiarity of having similarly clothed sexes.

91. Munia acuticauda, Hodgs. As. Res. xix. p. 153, 1836.
M. muscadina, Gould.
M. molucca of my Amoy List, Ibis, 1860, p. 61.
M. minima of my Canton List, Ibis, 1861, p. 45.

I have specimens of this bird from Canton, Amoy, Shanghai, and Formosa. These I have carefully compared with Hodgson's examples from Nepal and others from Tenasserim, and found them identical. In Formosa this is an abundant resident species, being met with in all plantations throughout the low country in small parties. It is a lively little bird, constantly moving about its perch, whisking its pointed tail from side to side, and uttering a rather

musical trill-note. It generally prefers selecting a building-site in the neighbourhood of human dwellings, placing its Wren-like nest in some bush five or six feet from the ground, often in quite exposed places; but being such a small, delicate bird, and so gentle and familiar in its habits, it is protected by the Chinese, and looked upon as the harbinger of good. It is known in Amoy as the *O-pe-la*; in Formosa, as the *Aw-tsew-pe-la*. In its disproportionately large and not very elegant nest it seldom lays more than three eggs, quite white when blown, but when fresh, of a pale ochreous pink. The males and females are similar in plumage; the young are of a light olive-brown, whitish on the under parts, but always having the white rump-band.

This species has been semidomesticated in Japan, where it breeds, like the Canary, in confinement, and produces every variety of albinism and melanism. There are several living examples of these varieties at present in the gardens of the Zoological Society of London.

M. molucca (L.) and *M. striata* (L.) are closely allied to this species, but distinct.

92. Munia topela, n. sp. Chinese, *Topelá*.

M. malacca of my Amoy and Canton Lists, Ibis, 1860, p. 61. & 1861, p. 45.

The two species to which this bird is most nearly allied are the *M. punctularia* (*Fringilla nisoria*, Temm.) of Malacca, and the *M. undulata* of India. The former is distinguished from the latter by the whitish grey on the rump, upper tail-coverts, and tail, which is represented by glistening fulvous in the other species. In ours the upper tail-coverts are greenish yellow, and the tail washed with yellowish green. The upper parts are a dull brown, instead of reddish chocolate, most of the feathers having whitish shafts, and being obscurely barred with a deeper shade of brown; the rump-feathers margined with yellowish white. Throat deep chocolate-brown, not reddish. Horseshoe-shaped striæ on the breast light chocolate, those on the flanks dull blackish. Centre of belly white; vent and tibiæ the same, mottled with brown. Axillaries and underwings tinted with ochreous. The two central tail-feathers in adults

prolonged and pointed. Bill deep bluish grey, approaching to black. Legs and toes light purplish lead-colour, with pale brownish soles; claws flesh-brown, with light edges. Iris chocolate-brown. Length $4\frac{9}{10}$ in.; wing $2\frac{1}{10}$; tail $1\frac{8}{10}$, of 12 feathers, the outer one shortest and not so pointed as the rest, the next four graduated slightly, the two central pointed, and by about $\frac{2}{10}$ in. the longest.

The young have brown bills. Rictus white; inside of mouth yellowish flesh-colour. Their legs are flesh-coloured. Their tail-feathers are of the same length and form as those of adults. Their upper parts are of a uniform light yellowish brown. The under parts a much lighter tint of the same colour, the centre of the belly being white. Quills dark hair-brown. Skin round the eye greyish brown; iris blackish brown. In the early spring the horse-shoe feathers of the under parts begin to show themselves, but it is seldom until the second year that the moult is complete.

Mr. Blyth considers this species distinct; and in my large series of skins I find constant uniformity in the peculiarities that distinguish it from its allies. In China it is abundant from Canton to Shanghai, and in Formosa all throughout the plains. It is more a bird of the open country than the last, roaming about in autumn and winter in large flocks, like Sparrows and Linnets. It also rarely goes into the retirement of woods and groves for nesting-purposes, preferring isolated trees, bushes, or palms, in the exposed open fields. In one of these its nest is stowed away—a large woven mass of coarse dried grass, generally lined inside with finer materials. It is of a globular form, with a hole on one side, resembling the nest of some murine animal. The eggs number 7, 5, or 3, but more frequently 3. They are white, oblong, larger than those of the last species, and not so narrow. It has usually three nests in the season. The notes of this bird are louder and somewhat different from those of the preceding species. It is also a heavier and more Sparrow-like bird. It is often kept in confinement. When singing, the male draws himself up to his full height and stretches out his head, the beak is opened, and the throat shaken; but only a low murmuring sound is emitted, which is scarcely audible to a person standing close to the bird: it is the most absurd attempt at singing

that ever I witnessed; and yet it draws forth the admiration of the females; for while he is so engaged, numbers draw round him and bend their heads forward to listen.

93. Heterornis sinensis.

Oriolus sinensis, Gm.

O. buffonianus, Shaw.

Pastor turdiformis, Wagler.

Sturnia cana, Blyth (the young).

This summer visitant to South China winters in Pegu. In its summer migrations the neighbourhood of Amoy appears to be its northern limit; for it is not found in Foochow. It is not a regular visitant to Formosa, a few only straggling to the south-west coast, about Apes' Hill, in autumn and spring. These do not stay, but leave again so soon as their strength and the weather permit.

94. Sturnus cineraceus, Temm. Pl. Col. 563; Faun. Japon. pl. 45.

This species visits our Formosan plains in large flocks at the end of October and beginning of November. These range about the country, feeding largely on the figs of the Chinese banyan. In spring they all return northerly. On the south coast of China they are also winter visitants, retiring to Mantchuria and Japan to breed. This species and the *S. sericeus,* Gmel., are closely allied in form and habits, and appear to link the small *Heterornis* group of Starlings with the true *Sturnus.*

95. Acridotheres cristatellus, L.

Pastor philippensis, Temm.

This is doubtless the bird described by Linnæus from specimens brought home by Osbeck from Canton; but the name has, unfortunately, by later ornithologists been applied to numerous cognate forms. In China our bird abounds from Canton to Shanghai. It is common in the level country of Formosa, and, I believe, occurs also in the Philippines. I have compared my specimens from Formosa with some from China, and found them identical. It is, like the Sparrow, of very domestic habits, being partial to the haunts of man, and frequenting the roofs of houses and temples. The Chinese entertain a great love for it, and often

confine it in cages. It learns to speak, and imitates well the human voice. It builds in the holes of trees or walls, but more frequently constructs a large-domed Magpie-like nest on the tops of high fir trees. Its eggs are blue, and vary from three to seven in number. It bears the general name of *Pako,* or "Eight Brethren" (it being usually seen in parties of that number); but the Amoy provincial name is *Ka-ling*. It abounds in Formosa all throughout the year.

A young bird procured 18th July 1861, at Taiwanfoo, had the bill pale yellowish horn-colour. Roof of mouth, inside of bill, and tip of tongue yellow; the rest flesh-colour, with a bluish-black tinge. Iris light greenish yellow. Legs light brownish yellow on the under parts, sole, and joints of scales; the rest purplish brown, darker on the claws. The nose-crest scarcely perceptible. The feathers of the head and under parts edged with brown, and the rest of the plumage more or less tinged with the same. Outer tail-feathers and under tail-coverts tipped, not with white, but with dusky yellowish brown.

96. Corvus sinensis, Gould.

In the south-west plains of Formosa I observed no Crow; but in the interior hill-ranges, near Tamsuy, I noticed parties of a black species, which, from its peculiar voice and habits, I took to be the species that is found throughout China. Unfortunately I did not procure a specimen, owing chiefly to the great objections the natives had to shoot them. The Chinese colonists there look upon this bird with a kind of superstitious reverence; "for," say they, "whenever the savages sally out and kill any of our number, this Crow always sets up a sympathetic *laou-wa* (or wailing cry)." I asked them if the Crow was not always setting up this cry, whether any mishap had happened to them or not. In reply to this, they shrugged their shoulders and laughed, as they always do when the follies of their superstitions are pointed out to them, but they do not believe in them the less for that.

97. Pica media, Blyth.

P. sericea, Gould.

Observed in great abundance in the large level tracts near

Taiwanfoo, where it is a resident species, but rarely in the hilly parts of the North-west. It is identical with the race that occurs throughout China and Japan.

98. Urocissa cærulea, Gould, P. Z. S. 1862, p. 282.

Soon after my arrival at Tamsuy, some hunters that I had sent into the interior returned with the two long tail-feathers of a beautiful bird which they said they had shot, but were obliged to eat, as, owing to the heat of the weather, it was getting tainted. They called it the *Tung-bay Swanniun*, or Long-tailed Mountain-Nymph. I saw, from the peculiar form of the feathers, that the bird from which they had been extracted must have been a *Urocissa*, and, from their bright blue tint and large white tips, I felt sure they belonged to some fine new species. I was much excited, and offered large sums for specimens, and consequently soon received an ample supply, which fully confirmed my belief that the Formosan *Urocissa* was a peculiar and beautiful form.

The Mountain-Nymph is by no means an uncommon bird in the large camphor-forests of the mountain-range. It is there to be met with in small parties of six or more, flying from tree to tree, brandishing about their handsome tail-appendages, and displaying their brightly contrasted black-and-azure plumage adorned with white, and their red bill and legs, among the deep foliage of the wood. They are shy birds, soon taking alarm at the approach of a stranger, giving warning to each other in loud notes, and then gliding away one after another with a straight flight into an adjoining tree (the flight being executed with short quick flaps of the wing, while the body and tail are held nearly horizontal). They feed on wild figs, mountain berries, and insects, chiefly Melolonthine Coleoptera. I had no opportunities of observing the nesting of this bird, nor the plumage of the young, which in the *U. sinensis* differ considerably from that of the adult.

In the large size and bulkiness of its bill, this species is more nearly affine to the *Urocissa magnirostris* of Tenasserim than to *U. sinensis* of China; but its tail is shorter than that of either, and its plumage is entirely different to the similarly distributed tints of the four other described species.

Note on a female shot 27th March, 1862.—Length 20½ in.; wing $7\frac{5}{10}$; tail $13\frac{3}{4}$; tarse $1\frac{5}{8}$. Bill and legs bright red lead, the former tipped paler; sole-pads light and dingy; claws light reddish brown. Inside of mouth flesh-colour; tongue broad and fleshy; apical $\frac{2}{10}$ths horny and ochreous, terminating obtusely with cilia a little turned up. Iris clear light king's yellow, somewhat pearly in appearance. Ear-covert nearly as large as the eye, with an operculum small and almost central. Eyelid thick, blackish brown, with a narrow outer rim of orange lead-colour.

The ovary contained numerous partially developed eggs; the oviduct was well developed. Right lobe of liver $1\frac{4}{10}$ in.; left $1\frac{2}{10}$. Œsophagus ½ inch wide, enlarging into the proventriculus, which gradually distends as it descends. Stomach an irregular oval, somewhat flabby, and not very muscular, $1\frac{3}{10}$ in. long, by 1 broad, and ½ in. deep. Epithelium somewhat thick, furrowed widely in all directions; containing a small Melolonthine beetle, a large berry-seed, and remains of banyan-figs. Cæca about $\frac{4}{10}$ in. long, and $\frac{1}{10}$ thick, one placed a little higher than the other, and distant about ¾ inch from the anus. Intestine 14½ in. long, thick and fleshy, varying in thickness from $\frac{3}{10}$ to $\frac{6}{10}$.

The male has a larger bill, and somewhat longer wings and tail, than the female; but both sexes vary a good deal in proportions *inter se*. In the older specimens the *tomiæ* of the upper mandible are often worn into a serrated appearance.

Entire head, hind neck, throat, and breast black. General plumage dusky purplish azure, duskier on the under parts. Wings brownish black, the outer webs of primaries and secondaries and the greater part of the tertiaries being of the same colour as the back, a large white spot at tip of each quill, becoming smaller and obscure as the last primaries are reached. Underwings washed with rufous. Upper tail-coverts broadly margined with black, preceded by a whitish shade, and in some cases tipped with a white spot; these feathers have a beautiful appearance. Tail consisting of twelve feathers; the two central ones somewhat spatulate at the end, with turned-up sides, the *spatulæ* white, the remaining portions of the two feathers purplish azure, with black shafts; the 2nd tail-feather with a much smaller white spot, preceded by a broad black band, the black increasing in extent on the other

lateral feathers. Vent pale, broadly tipped with a pale glowing rufous tint. Undershafts of wing and tail-feathers ochreous, the underside of the white tips being washed with a pale rufous glow.

99. Garrulus taivanus, Gould, P. Z. S. 1862, p. 282.

This small mountain species represents, in Formosa, the Jay that frequents the hill countries of South China, from Canton to Ningpo, *G. sinensis*, Gould. The Formosan Jay has a comparatively larger bill, and is at once distinguishable from its Chinese congeners by its much smaller size, by its black frontal band from nostril to nostril, by its whitish ring round the eye, by the somewhat different arrangement of blue, white, and black tints on the wings, and by the greater extension of white on the margins of primary quills. Though the members of this genus are somewhat migratory, yet their peregrinations are always within a limited sphere; and wherever the Jay occurs in isolated localities, we meet with aberrations from the typical form. This apparent rule in this interesting group is highly suggestive.

I have only one pair from Formosa; but the characters, which I now proceed to define, are constant.

Length $10\frac{1}{2}$ in.; wing $6\frac{3}{10}$; tail 5 in. (of 12 feathers of nearly equal length); tarse $1\frac{3}{8}$; bill along culmen 1 in., from rictus $1\frac{1}{4}$. General plumage light vinaceous, greyish on the back and scapulars, and delicately barred on the crown with a deeper shade. Rump-band and upper tail-coverts white. Tail black. Abdomen and vent white. Bill bluish grey on rather more than the basal half; apical portion black. Feathers over the nostrils and round the base of the bill black. A ring of white feathers round the eye. Legs light ochreous brown, with brown claws. Irides light clear blue. Quills black, the 2nd primary margined for nearly its whole length with white, the 3rd to a less extent, the 4th less still, until the inner ones have scarce any indication of it; the secondaries with more than their basal half of the outer webs having bars of white blending into deep blue and then black, in consecutive order. The primary coverts and winglet similarly barred, but more closely, the black bars being broader; the foremost secondary coverts bluish grey, finely barred with indistinct black and blue striæ. Lesser coverts vinaceous brown,

broadly tipped with a rufous hue of the same. The rest of the wing black. Undershafts of quills and rectrices pale ochreous brown.

100. Dendrocitta sinensis, var. formosæ.

In China I never had the good fortune to meet with this interesting form, though doubtless it must occur in some of the interior hills. In the inner ranges of the Formosan mountains it was common enough, rarely if ever descending to the cleared hills or the lowlands. The Formosan bird offers a few distinctions, but they are too trifling to be regarded as specific. It has a less bulky bill, the black frontal band is much narrower, and the throat is never so black; but in general style of colouring it is so similar to the Indian bird, that it is impossible to separate them.

Bill and legs greyish black; claws brown. Crown, hindneck, rump, and upper tail-coverts bluish grey. Lores and frontal band brownish black. Neck, sides of neck, and breast light greyish chocolate-brown, deeper on the cheeks and throat, and paling on the flanks and belly to almost white. Axillaries and tibiæ deep blackish brown. Vent a fine rufous buff. Back and scapularies clear yellow chocolate-brown. Wings a fine glossy black, duller on the primaries, across which near their bases a bar of white runs, commencing on the inner web of the 2nd quill, and widening as it runs. Tail composed of twelve greatly graduated feathers, broad, and cut nearly square at their ends, with the tips of the shafts slightly projecting; the two central ones black on about the apical half, the remainder bluish grey, but the proportions of these two colours vary in different individuals: the rest of the rectrices black, with a little grey at their bases.—Length 13 in.; wing $5\frac{1}{2}$; tail $7\frac{1}{4}$.

The females appear to be rather duller-coloured than the males, but they are otherwise similar.

An interesting account of this bird and its nesting-habits is given in the Catalogue of Birds in E. I. C. Museum, vol. ii. p. 569, to which I would refer my readers.

101. Megalæma nuchalis, Gould, P. Z. S. 1862, p. 283.

The only species of this genus known from South China is

the great *M. virens,* which is also an abundant bird in some parts of India. In Formosa it is represented by this smaller but more lovely species, the *Hoë-kwa-cheow,* or Embroidered Bird, of the Chinese colonists. This Barbet is a true forest-bird, frequenting the higher mountains of the interior, where it may be met with in great abundance, though generally scattered through the wood singly or in pairs. It affects the highest branches of large trees, sitting solitary and often motionless for hours together. Its note is loud and discordant, the bird often making its presence known by its voice when one would otherwise pass it by unnoticed from the resemblance of its plumage to the general foliage. When seen flying from tree to tree, it looks like a cross between an Oriole and a Parrot, if such a thing can be imagined. It feeds on berries and occasionally on insects, also, as I am told, on small birds.

Bill light bluish grey at the base of upper and basal half of lower mandible, the rest deep greyish black. Legs leaden grey, with a greenish tinge; sole-pads dingy brownish; claws brownish white, greyish black on their arches and sides. Irides reddish-brown. General plumage yellowish green. A spot on each lore, a large one on the breast, and a somewhat obscure one on the upper back carmine. Fore part of the crown greenish yellow, golden near the bill, and blending towards the occiput into the fine light-blue nuchal band that encircles the head including the cheeks, but narrowing on the underneck above the red spot. Throat above this band golden yellow. A band of black runs over the eye and ear-coverts; another starts from the nostrils, passing the red loral spot, reaches under the eye to the ear-coverts; the feathers of this band are tipped under the eye with blue, near the bill with greenish. Tail a fine green, with black shafts. Quills black, broadly margined on their outer webs with green, the primaries having further a yellowish edge; some of the tertiaries almost entirely green. Under parts pale leek-green, brighter and yellower on the breast. Axillaries, inner edges of most of the remiges, inner portion of tibiæ, and a part of the belly pale yellow.—Length $7\frac{8}{10}$ in.; wing $4\frac{2}{10}$; tail $2\frac{8}{10}$, of ten slightly graduated feathers; under surface greenish blue, with pale ochreous shafts. 1st quill short, 4th and 5th longest.

Numbers of long stiff bristles spring from base of bill, forming three sets—one from nostrils, one from base of upper mandible, and one from chin or under angle of gonys. The feathers of the back are olive-green, broadly margined with a brighter yellowish green.

102. Gecinus tancola, Gould, P. Z. S. 1862, p. 283.

The Formosan Green Woodpecker is a local representative of the larger Himalayan form, *G. occipitalis*, which is, however, at once to be distinguished from it by its greater dimensions, by its large entirely black bill, by the sides of its neck being yellowish green instead of grey, by the brighter yellowish green of the breast, belly, and back, by its lateral rectrices being entirely brown instead of partially brownish white, and by its primary coverts being margined on the outer web with golden green instead of being barred with brown. The wing is shorter in the Formosan bird; and the primaries have fewer whitish spots, and only just indications of some on the outer edge of the 1st primary, instead of distinct spots; and a grey eye-streak divides the black on the lores from the red frontal crest. Bill blackish grey on the upper and nearly whole apical half of the lower mandible, the basal edge of upper and rest of lower being greenish yellow. Legs deep leaden, with a tinge of olive-green; sole-pads brownish; claws leaden black. Irides pearly white.

When in the mountainous country near Foochow, in May 1857, I procured a male and two young of a very similar species to this, but differing in having the two lateral rectrices on each side banded with brownish white, and having the pale bars on the two central rectrices carried up to the shafts instead of separated from them by a line of brown. The series of specimens I have from Formosa vary but triflingly in the colouring of the tail; but then they are all from the same neighbourhood (Tamsuy mountains). I suppose, after the fashion of the late splitting-up of the Woodpecker species, we must consider the Foochowan distinct from the Formosan bird.

Length 10½ in.; wing 5½; tail 4$\frac{3}{10}$. Forehead, in male, carmine; in female, grey broadly streaked with black, like the rest of the crown and hindneck.

The term *tancola* is the Foochow name for the bird that occurs there.

103. Picus insularis, Gould, P. Z. S. 1862, p. 283.

In this we have a small but somewhat close ally of *P. leuconotus*, a bird found throughout Siberia as far as Northern Japan. The species from the Formosan forests has, like it, a red crown in the male, and the lower part of the back white; but it is much smaller in size, and differs in particular colouring.—Length 9 in.; wing $5\frac{3}{10}$; tail 4.

Bill leaden grey, washed with brown, the gonys and apical quarter of lower mandible being light pinkish brown. Legs and claws deep leaden grey, the latter with whitish bases. Crown-cap in the male carmine, the bases of the feathers being black, in the female entirely black; frontal band white. A broad black line runs from base of bill, passes round nape to occiput, whilst a continuation of it runs broadening down the sides of breast, breaking up into long spots which run thickly down the flanks. Ground-plumage of under parts dingy ochreous white, varying in intensity. Centre of belly and vent washed with carmine. Back, upper tail-coverts, and wings black, the latter rather sparsely spotted on the quills with white. A broad white band crosses the rump and lower back; and rather higher up a few feathers are spotted at their ends with the same. Four central rectrices black; the next on each side with two ochreous spots on the outer webs near the tip; the two outer ones with four ochreous white bands, more or less developed, across the black feathers.

In the young bird the black is dull and brownish, the light parts are whiter, and the crimson on the vent and belly is very pale. The white on the lateral tail-feathers is also somewhat differently distributed.

104. Picus kaleënsis, n. sp.

The only species of this spark-headed group that I found in China occurred near Peking. I have described it in this Journal (*anteà*, p. 96) as *P. scintilliceps*. This is another of the same type occurring throughout Formosa. I have a male specimen before me from the S.W. plains near Taiwanfoo, and several from the

hilly regions about Tamsuy. It is usual, in the Woodpecker group, for the more northerly birds to have whiter tails; but in this respect our Formosan examples offer the reverse of the rule, for the southern specimen has broader whitish bands and narrower blackish ones than the northern specimens. This may, however, be owing to age or some other cause. The two birds are otherwise too similar to admit of separation. There is a strong resemblance between the Formosan and the North China forms; but the latter are at once distinguishable by their white instead of barred axillaries, by the outer tail-feathers being yellowish white, with but very faint indications of bars, by the back being almost entirely white, by all the spots on the plumage being larger, and by the black streaks on the under parts being narrower and much fainter. They are certainly more distinct from each other than most of the numerous species into which this group is divided.

♂, shot 10th October 1861. Length $6\frac{6}{10}$ in.; wing $3\frac{6}{10}$; tail $2\frac{4}{10}$. Bill light leaden grey, blackish towards the tip, and tinged with greenish yellow at basal half of lower mandible. Inside of mouth flesh-colour, tinged with violet-grey. Skin round the eye blackish grey, with black rim. Iris reddish brown. Legs greenish grey; claws same, with pale bases. Fore part of crown brownish grey. Occiput, back, and wings black; lower part of back broadly barred with white; white spots on the wing, somewhat scanty; spots on some of the lesser coverts large. Four central rectrices black, the vent with a pale ochreous outer edge; the one that follows with a broad outer edge, the tip and a zigzag bar of light brownish ochre; the extreme lateral feathers with the basal edge, the tip, and two well-defined bars of the same. A light brown streak runs from the corner of the eye across each cheek; another of light blackish brown runs from the lower mandible down the neck. Throat and axillaries white, the latter banded with black. Under parts dingy ochreous, with broad blackish-brown streaks on the breast, and narrower ones on the belly and flanks. The male carries a streak of carmine on each side of the occiput, which is wanting in the female.

♂. Heart $\frac{1}{2}$ in. by $\frac{4}{12}$. Liver, right lobe $\frac{7}{10}$ in., left $\frac{6}{10}$. Rings on trachea and bronchi, especially on the latter, widely set.

Testes small and ovate. Stomach heart-shaped, having a somewhat three-lobed appearance, $\frac{6}{10}$ in. long, $\frac{4}{10}$ broad, $\frac{3}{10}$ deep, not very muscular; epithelium moderately thick, deeply and closely furrowed with rugæ, and filled with minute white larvæ. Intestines about 9 inches long, from $\frac{1}{10}$ to $\frac{2}{10}$ thick, with no cæca.

The bill of this, as indeed of all species of Woodpeckers, is valued by the Chinese for medicine. The name applied to the whole group by the Amoy Chinese is *Tok-chew*, or Wood-tapper.

105. Centropus viridis.

Cuculus viridis, Scop.

C. lepidus et *C. affinis*, Horsf.

Chinese name, *Bang-king*.

This is the common and only Crow Pheasant of Formosa. It abounds throughout the plains and lower hill-ranges of the entire island. It is subject to three stages of plumage:—that of the first year, when the upper parts are light rufous, banded with black, the bands on the tail being broader and tinged with green, the throat and under parts being white, washed here and there with rufous; that of the second year, when the upper parts are brown, streaked chiefly along the shafts with light ochreous, the long upper tail-coverts being closely barred with greenish black and rufous ochre, the tail being greenish black, more or less washed with rufous, the wings rufous more or less washed and barred with brown, and the under parts light buff, streaked along the shafts with paler, and barred and mottled with brown; and that of the third year, or adult plumage, when the bill, from a light colour, has become black, the head, neck, lower back, rump, tail, and entire under parts (except the axillaries, which are still rufous) glistening with dark green, and sometimes with purple, the centre of the back, the wings, and the scapulars being rufous, many of the feathers of the latter and the tertiaries having pale ochreous streaks along their shafts. But the period of change is so inconstant, that at the same season you can procure specimens in almost every plumage and almost every intermediate stage of change. The males are generally much larger than the females; but size is in this bird exceedingly variable, scarcely two being found to have the same

general length, the same length of wing or of tail; and their bills also vary greatly in length, in breadth, and in thickness. Indeed, if out of my series two extremes in form were selected, a modern naturalist would have no hesitation in consigning them to separate species. Hence the confusion that has arisen in this widely distributed species, and the number of synonyms it possesses.

This bird is fond of perching on the thick foliage of evergreen trees, balancing itself on its unstable perch by means of its wings, and springing from one branch of leaves to another, by means of its long Lark-like claws, after locusts and other soft insects of that family. It suspends its large rush-framed cradle between the long leaves of the sugar-cane and other reeds, weaving the dried hanging leaves into the bottom of its nest, and thus forming them into supports. In this rather rude structure it lays generally four white eggs, which vary much in shape and size, but are usually obtuse at both ends, averaging 1·3 by 1 in., are rather thick-shelled and rarely glossy. On the notes of the bird I have remarked in previous papers. Its flight is straight, executed with short flaps and once and again a motionless sail through the air, the tail being held somewhat horizontally, but generally rather on the decline. At the end of September 1861, a nest of four live young birds was brought to me, and I kept them alive some time. Like other young Cuckoos, their appetites were insatiable; and when nearly choking, they would still continue their cry for more food. This cry is a loud and frequent imitation of the syllable "churr." As soon as you left them to themselves, their notes would change to *toc-toc-too*, uttered in a subdued voice. This last note is often heard from the adult bird. The little creatures, only partially clothed with a rufous down, with the quills only just beginning to sprout, looked complete oddities. Their mouths were of a dark red-pink. A week after, the insides of their mouths had paled to flesh-colour with the top of the tongue black, the beak was flesh-coloured, washed with brownish, irides grey, legs leaden violet; the lark-heel was then very short.

I extract from my journal a note on a full-fledged bird, shot 4th October 1861:—"Bill flesh-coloured, except the culmen, which is broadly marked with blackish brown. Inside of mouth

flesh-colour, with a wash of ochreous, marked on tongue and lower jaw with blackish; basal two-thirds of tongue covered with inverted papillæ; roof of mouth also papillose. Iris umber-brown. Skin round eye and ear purplish grey. Legs slate-colour, with light-yellowish-grey soles. Lark-heel well developed, and with other claws coloured blackish brown, with pale tips and undersides."

Adult ♂, shot 20th July 1861. "Length 14 in.; wing $6\frac{2}{10}$; tail $7\frac{1}{4}$. Bill black, inside and tongue blackish grey; roof of mouth and base of tongue ochreous flesh-colour. Skin of head deep purplish grey. Iris yellowish brown; skin round eye greyish black. Legs and toes deep blackish grey, pale and yellowish at the joints and soles. Feathers of the wings and tail much abraded."

Another adult ♂, shot 8th August 1861. "Length $15\frac{1}{2}$ in.; wing $6\frac{8}{10}$; tail $8\frac{1}{2}$. Bill black; inside of mouth blackish grey. Iris brown, with a ring of straw-yellow. Ear-opening horizontally lunate, $\frac{3}{10}$ in. long. Legs blackish grey, blacker on the claws."

Another in second plumage, shot 27th December. "Length $14\frac{1}{2}$ in.; wing $6\frac{7}{10}$; tail $7\frac{3}{10}$. Bill pale fleshy horn-colour, the basal part of culmen being blackish brown. Inside of mouth pale yellowish flesh-colour. Irides brownish ochre, the upper eyelid having several coarse black lashes with white bases. Tongue broad at the base, sagittate; apical half horny and furrowed; basal half fleshy, and covered with inverted papillæ, as also is the roof of the mouth. Legs leaden grey, with light yellowish-grey soles and light blackish-brown claws."

106. Cuculus kelungensis, n. sp.

Of the many confused groups of birds, none are in such a hopeless state of inextricable confusion as the Cuckoos. This is owing to the difficulty of pointing out sufficiently recognizable characters to enable others to distinguish the particular species which the discoverer wishes to describe from its numerous closely allied congeners. If difference of note is to be taken as a guarantee of difference of species, then must we consider the many Eastern forms distinct; but when we come to compare individual

birds, we find the specimens so variable, and running so much one into the other, as to make it next to impossible to draw up definite distinguishing characters, and to lead one almost to suppose that the various races interbreed. Mr. Blyth has kindly looked over my many Cuckoos from China and Formosa, and declares that the majority of those from Amoy, and all from Peking, belong to *C. canorus*. These I had noted in all my previous papers as *C. striatus*, with the statement that the note of our bird was identical with that of the English Cuckoo. I must, however, in justice to myself, declare that the mistake occurred through the wrong identification by Mr. Blyth of a skin of *C. canorus*, sent from Amoy, before that gentleman had studied the Cuckoo-group so well as he has since done. At Amoy Cuckoos come to us merely on their hasty passage in their vernal and autumnal migrations, and we therefore have seldom an opportunity of hearing their notes. I have, however, in the interior of the country, near Amoy, watched a Cuckoo which uttered quite a peculiar note. Of this bird I possess one specimen, which Mr. Blyth identifies as the *C. micropterus*, Gould. I have another from the same locality set down by the same authority as the *C. himalayanus*, Vigors (see Gould's Cent.), which equals *C. poliocephalus*. To this last our North-Formosan bird is most closely allied, but is bigger, with a larger and longer bill, and with the whole of the breast bluish grey. As all the four specimens I possess from Formosa agree in these peculiarities, I have thought it right to keep them, for the present at least, separate from the Chinese bird. I believe the Formosan bird is a summer visitant only. All my skins of this race were procured, in April, in the North of Formosa; and as I did not procure it in the S.W., I have named it after the northernmost district, *Kelung*. In the proportions of their wings and tails the specimens vary, but the males are always decidedly larger than females.

♂. Bill along culmen 1 in.; along base of lower mandible 1·15. Total length 13 in.; wing 7·7; tail 6·6. Upper mandible and apical three-tenths of lower blackish brown. Basal edge of upper and remainder of lower orange-yellow, the latter tinged with green and dingy. Inside of mouth orange. Rim round eye orange-

yellow. Iris light chestnut-orange. Legs and claws orange; the toes lighter, and some of them washed over the greater part with blackish grey. Ear-covert roundish, smaller than the eye, the aperture occupying the upper semicircle.

The colours of the Cuckoos are too variable to hope upon them to establish specific characters. The form and size of the bill appear to be the most constant characters, and these require personal comparison to ensure correct identification.

I have frequently met with the North-Formosan Cuckoo in my rambles, but have unfortunately never heard its notes. It is a common summer bird about all the hilly region near Tamsuy and Kelung.

107. Cuculus canorus, L.

On the coast near Taiwanfoo I procured a stray specimen of this species. Mr. Blyth has examined and identified it. It was procured in September, and was apparently on its southerly migration. I never heard or saw the European Cuckoo at any other time in Formosa.

108. Treron formosæ, sp. nov.

I have unfortunately only a female of this interesting Green Pigeon. It was shot in the neighbourhood of Taiwanfoo on the 21st August 1861, where it was a rare bird. I had an opportunity of once seeing a male close to my garden in that city, and I was told by a mandarin that he had kept a pair alive in a cage. It is a forest-loving bird, and, I dare say, not rare in the mountains of the south; but in the mountain-forests inland of Tamsuy I did not meet with it.

Length $12\frac{3}{4}$ in.; wing $7\frac{2}{10}$; tail 4, somewhat wedge-shaped, the feathers being rounded at their tips. Bill, basal two-thirds cobalt blue; apical pale, with a tinge of yellowish. Bare skin round the eye bluish grey. Iris comprising a bluish grey ring round pupil, then a narrow black ring, then a pearl-grey ring, and lastly a broad black ring. Legs madder-pink, with pale yellowish soles and blackish brown claws. Upper parts rather dark green, yellow on the head and rump. Throat grey, each feather margined with yellowish green. Breast and belly yellowish green, yellower on the belly. Abdomen primrose-yellow. Flanks and

vent dark green, broadly margined and tipped with primrose. Quills black, delicately margined with greenish yellow, 2nd quill rather longer than 3rd, and longest in wing; primary coverts and secondaries black, margined with clear yellow; tertiaries and other coverts green, some of them being likewise margined. Axillaries and underwings slate-grey. Tail olive-green, with a good deal of brown on the inner webs, the shafts of the feathers being light brown; undertail blackish brown, paling towards the tip and at the edges.

There is much similarity between this bird and the *Vinago sieboldii*, of the 'Fauna Japonica;' but this is a good deal smaller, differs in particular tints, and has a more decidedly Treronine bill.

109. Turtur rupicola (Pallas).

Columba orientalis, Lath.

C. gelastes, Temm.

I procured a pair of this Turtle-Dove at Tamsuy on the 1st of April. They were frequently seen during winter, and I think are in Formosa, as in South China, merely winter visitants.

110. Turtur chinensis (Scop.).

The ordinary resident Turtledove of all North China, from Canton to Shanghai, is also the prevailing species throughout Formosa. I can discover no distinction between them in my series of skins from both countries. Their nests are small flat panniers, of the usual form, and contain two white eggs, rather glossy, averaging in length 1·1 in. and in breadth ·85.

111. Turtur humilis, Temm.

Very abundant during summer in the low country about Taiwanfoo. The young males cast off the immature garb very rapidly, and assume that of the adult in the moult of the first autumn, their full plumage being almost complete when they leave the country in the fall. Often nestlings in mottled plumage, with down still adhering to them, show here and there a red feather of the male plumage. The *coo* of this species is a peculiar kind of rumbling murmur, not unlike the sound produced by one branch rubbing against another.

Young, procured 18th July 1861. "Iris dusky yellowish brown. Bill, bare flesh round the eye, and throat-skin purplish

flesh-brown. Legs a similar colour, much paler on the soles and undertarsi. Feathers of the back, breast, and wing-coverts broadly edged with yellowish brown."

♂, shot 23rd July, 1861. "Length 9½ in.; wing 5½; tail 3 8/10. Bill purplish black; skin round the eye yellowish grey. Iris dark brown. Legs and claws deep purplish brown, with whitish undertarsi and edges to scales, and yellowish soles. Crop distended with black sesamum-seeds. Length of intestine 15 7/10 in.; cæca very small, situate about 1 2/10 from anus."

The eggs of this species are, as usual, two in number and white; they measure ·97 in. by ·26.

112. Coturnix communis, Bonn.

Occurs all the year round, but more abundantly during winter.

113. Turnix ocellatus (Scop.). Chinese name, *Bo-bay* (tailless) *Kaw-toon.*

This is not an uncommon bird on the plains near Taiwanfoo, but, from its small size and skulking habits, is hard to flush without a good dog. A pair of little chickens were brought me on the 19th August 1861. Their cry was not unlike that of a domestic chicken. Bill blackish, purplish towards the base, yellowish inside the mouth and at the angle. Iris blackish brown. Legs and claws pale ochreous yellow. Bare skin round the eye and ear leaden grey. General colour of the down light ochreous, striped on the upper parts longitudinally with black and rich chestnut-brown, presenting a mottled appearance. I also procured a nest with four eggs in it—the usual number, I am told, laid by this species. The nest was a loose structure of fine grass, with seed-tops quite green, lined with drier materials, the whole being placed in a depression in the ground. The eggs varied greatly in size, and were of a light rich sepia-tint, mottled and blotched with deeper shades of the same, in two conspicuously at the larger end, in one at the smaller, and in the smallest egg not blotched at all. Two of the eggs measure about ·9 in. long and ·75 broad. Of the other two, which are nearly of a size, the smaller measures ·67 by ·6 in.

114. Excalfactoria chinensis (L.). Chinese name, *Koo-lew.*

This widely distributed, prettily marked Quail occurred also in the plains. Eight small eggs, of a clear uniform light olive-

brown colour, almost similar to those of the Nightingale, were brought to me on the 21st August 1861. The native declared them to be the eggs of the *Koo-lew*. The eggs vary only triflingly in size, the largest being 1 in. by ·82.

115. Bambusicola sonorivox, Gould, P. Z. S. 1862, p. 285. Native name, *Teëk-koë* (Bamboo-fowl).

This and the cognate form from the Foochow hills, *Perdix sphenura*, J. E. Gray (*Perdix thoracica*, Temm.), Mr. Gould has, at my suggestion, separated into a distinct genus.

Bill leaden black, the upper mandible having a brownish white tip. Legs, toes, and spurs dark brownish olive-green, blacker on the toes, and whitish brown on the claws.

Length $9\frac{1}{2}$ in.; wing $5\frac{2}{10}$; tail $3\frac{8}{10}$, of 14 rectrices, much graduated, the outer one being $1\frac{3}{10}$ shorter than the central, ends rounded. Wing much rounded; the 4th, 5th, 6th, and 7th quills nearly equal and longest. The hind tarsi armed with a sharp conical spur in the male, which is in the female replaced by a wart. Face, hindneck, and breast dark smoke-grey, mottled with very small dark specks; the feathers on the crown rufescent, with dark centres and rufous margins. Throat deep maroon-colour. Under parts ochreous clay-colour, most of the feathers being stamped with a large quadrangular spot of maroon. Axillaries brown, striated with a deeper shade. Tibial feathers, abdomen, and vent olive-grey in the male, clay-colour in the female, the vent with reddish-black spots. Feathers of the back olive-grey, finely mottled with black, and marked with a large central deep-maroon drop; the scapulars similarly coloured, with the addition of a white spot on the outer web of each; on the wing-coverts the grey gives place to light yellowish brown, and the white spots to ochreous. Primary quills deep brown, rufous on the outer web, mottled with black, and edged with light rufous brown; secondaries with a black ochreous mottling; tertiaries the same, having in addition an ochreous spot on the outer web, and a large spot of black-edged deep maroon near their tips. The white and ochreous spots on the wings and their coverts are of different shapes, varying from an arrow-head to an annular form. Lower back, rump, and upper tail-coverts

greyish olive-brown, finely mottled with black. Tail reddish brown, barred with black-edged bars of rufous ochre, and mottled all over with fine black striæ. The maroon spots on the under parts are more or less shaded with black.

The female is rather less strong in form than the male, has a wart instead of a spur, but, with the exception of the feathers about the abdomen, is otherwise similar.

The *B. thoracica* is at once distinguished from this species by the rufous of the throat being extended to the cheeks and sides of neck, by the rufous-ochre spots on its crown, and by the large spots on the under parts being black, as well as by other minor particulars in colouring. It is also of larger size and proportions.

A pair of immature birds were brought to me on the 16th August 1861. They uttered a continuous loud fowl-like scream. Their bills were blackish grey, with paler edges and tip; inside of mouth ochreous flesh-colour. Iris hazel. Rim round eye deep brown; bare skin about the eye greenish yellow. Legs dark greenish grey, with greenish incipient spur in the male bird, and brownish grey claws. Their stomachs contained grass-seeds. Their flesh was sweet and tender. The immature bird has no rufous on the crown; the grey of the neck is pale and brownish; the throat pale ochreous white; the under parts much lighter, with only a few spots; the tail redder, and the wing-coverts more distinctly spotted and marked.

This and the Foochow Bamboo-fowl are of very similar habits and notes. This species is found throughout all the hills of Formosa, generally scattered about the bush, never in coveys. It is very pugilistic, the males and females both singing the same loud cry, beginning with *killy-killy*, and ending rapidly with *ke-put-kwai*, which is so powerfully uttered that it may be heard at a great distance. They are not easily flushed, lying so close to the ground that you may walk over the spot whence the noise appears to come, and rarely put up the bird. Each pair selects its own beat, setting up, frequently during the day, the challenge-note; and woe betide any other Partridge that encroaches on the forbidden ground! They both set on him at once, and buffet him without mercy till he takes to his heels.

This pugnacious propensity often meets, as perhaps it deserves to do, with an evil fate. The Chinese fowler listens for the challenge, and sets on the disputed hill a trap with a caged decoy within. The decoy is trained, and sets up a reply. The lord and lady of the manor rush to the spot, and run recklessly into the trap and are caught. The captures are taken to the market and sold as cage-birds, the Chinese having a great love for the horrible screeching cry that this bird is incessantly sending forth. In the night this bird leaves the shelter of the grass and bush, and repairs to the branches of bamboos and other trees to roost. It is an excellent percher, being quite at home on a branch, in which respect it differs from the Chinese Francolin (*Francolinus perlatus*), which never perches. It nests in a depression in the ground, usually under shelter of a bush or tuft, and lays a large number of eggs—from seven to a dozen or more. The eggs a good deal resemble those of *Perdix cinerea*, being of a dark brownish cream-colour; length 1·38, breadth 1 in. I have, however, one very small egg, measuring 1 by ·85 in.

I add a note on a female *Bambusicola thoracica* (Temm.), procured at Foochow, 12th May 1862. "Length $10\frac{1}{3}$ in.; wing 5; tail $3\frac{2}{10}$. Bill blackish grey, with broad pale tip. Iris rich brown; eyelid brown. Legs and claws light greenish grey, with spur-wart of same colour."

116. Phasianus torquatus, Gmel.

The Pheasant found throughout the plains and lower hills of Formosa is identical with the Chinese Pheasant, the only noticeable difference between the two being in the Formosan having the ochreous flank-feathers very pale. In other respects, I think, their identity is complete.

117. Euplocamus swinhoii, Gould, P. Z. S. 1862, p. 284.

I was informed by my hunters that a second species of Pheasant, which was denominated by the Chinese colonists *Wá-koë*, was found in the interior mountains, that it was a true jungle-bird, frequenting the wild hill-ranges of the aborigines, and rarely descending to the lower hills that border on the Chinese territory, and that in the evening and early morning the male was in the habit of showing himself on an exposed branch or

roof of a savage's hut, uttering his crowing defiant note, while he strutted and threw up his tail like a rooster. I offered rewards and encouraged my men to do their utmost to procure me specimens of this bird, and I was so far successful that I managed to obtain a pair; but in my trip to the interior it was in vain that I sought to get a view of it in its native haunts, and to make acquaintance with it in a state of nature.

The female was brought to me on the 1st of April, soon after it was shot,—the heat of the weather compelling the hunters to skin it before they could reach me. It was, however, quite fresh enough to enable me to note the tints of its soft parts. "Naked patch on cheek large and conspicuously red. Bill dark greyish brown. Legs a clear vermilion, the scale-joints and sole-pads, as well as the claws, being dingy yellowish brown. Tail rounded, and consisting of sixteen feathers."

The fresh skin of the male arrived on the 11th April. My hunters had taken this bird alive; but it battered itself so, that they were obliged to kill it to save its feathers. The cheek-skin was of a bright crimson. Bill blackish grey, the apical half paling into ochreous brown colour. Legs bright pink-vermilion; soles a light dirty ochreous; toes the same, patched with blackish. To give my readers an idea of the plumage of this beautiful bird, I cannot do better than extract Mr. Gould's remarks on it from the 'Proceedings':—

"*Male.* Forehead black, gradually blending from the crown into the snowy-white lanceolate plumes which form a slight crest and continue in a narrow line down the nape of the neck. Back snowy white, offering a strong contrast to the narrow line with which it is bounded on each side, and the rich fiery chestnut of the scapularies; lower part of the back, rump, and upper tail-coverts intense velvety black, broadly margined with shining steel or bluish black, these scale-like feathers gradually becoming of a larger size and of a more uniform black as they approach the tail-feathers. Wings blackish brown, the greater and lesser coverts fringed with green; two centre tail-feathers snowy white, the remainder black; the somewhat elongated feathers of the chest and flanks black, with shining blue reflexions; thighs and under tail-coverts dull black. Legs and spurs blood-red, except

the tips of the latter, which are brown. Sides of the face wattled to an extent seldom seen even among gallinaceous birds; in front it extends to the nostrils, while posteriorly it terminates in a point near the occiput; a large lappet hangs down over each cheek, and a more pointed one rises, in the form of a horn, high above the crown, the whole being of the finest red, and covered with papillæ, as in the *Gennæus nychthemerus*; bill light horn-colour.

"Total length 28 in.; bill $1\frac{1}{2}$; wing 9; tail 17; tarsi 4.

"*Female.* This sex offers a strong contrast to the male, from there being no appearance of a crest in any specimen I have seen, and in the entire plumage being reddish or orange-brown, particularly the under surface; when examined in detail, however, many different but harmonizing tints are seen on various parts of the body: on the back of the neck, mantle, scapularies, and lesser wing-coverts the freckled brown feathers have lanceolate or spearhead-shaped markings, surrounded with black down the centres, while the rump and upper tail-coverts are more uniformly and more finely freckled with orange and dark brown; primaries alternately barred on both surfaces with chestnut and dark brown; secondaries dark brown, conspicuously barred with ochre-yellow; throat brownish grey; chest orange-brown, each feather with two crescentic markings of dark brown; centre of the abdomen and thighs orange-brown, slightly freckled with dark brown; two centre tail-feathers dark brown, obscurely barred with buff; lateral tail-feathers nearly uniform deep chestnut; bill horn-colour; space surrounding the eye and legs red.

"Total length 18 in.; bill $1\frac{1}{4}$; wing $8\frac{1}{2}$; tail 8; tarsi 3.

"*Remark.*—This exceedingly beautiful species is one of the most remarkable novelties I have had the good fortune to describe: in size it is somewhat smaller than the *Gennæus nychthemerus*, which it resembles in its red wattles and in the form of its tail; while in its strong legs, the scaly stiff feathers of the lower part of its back, the red and white colouring of the anterior portion of its upper surface, and in its steel-blue crest it more closely assimilates, in my opinion, to the members of the genus *Euplocamus*; and with that group (the Firebacks) I have accordingly associated it."

118. Glareola orientalis, Lath.

These birds abound on the flat marshy grounds near Taiwanfoo, and I there procured a good series of specimens in various stages of plumage. The dark parts of the adult are in the young brown, mottled with blackish brown, and margined with white, the collar being indicated by blackish spots. The upper parts at an early season in the autumn change to greenish brown, margined with light rufous brown; and the underneck and breast become rufescent, the collar becoming more strongly indicated. At all stages the axillaries are bright rust-red. In those I dissected the gizzard was roundish, compressed at the sides, with moderate lateral tendons; epithelium stained a sienna-brown, and containing remains of *Locustæ* and some small bits of porcelain and pebbles.

The flight of this bird is much like that of the Golden Plover, only swifter, with more evolutions. Its eggs are four in number, laid in a depression in the ground. It often feeds on the *Cicindelæ* that swarm on the sands: running with velocity after its prey, springing lightly into the air as the insect takes wing, and snapping it with a quick turn, in the manner of a *Muscicapa* it wheels round and alights again on the ground.

119. Squatarola helvetica (L.).

Frequents our shores, and the mouths of our rivers in winter. I procured one with indications of black on its belly, showing that in its summer retreat the nuptial plumage is assumed. This, however, as I have before observed, is not the case with birds in confinement.

120. Charadrius longipes, Temm.

Common with us all the year round, breeding in great abundance on the south-west marshy plains. Its eggs, four in number, are laid in a loose nest of dried grasses and fibres placed in a hollow. They are of a yellowish-grey ground-colour, blotched and spotted with deep blackish sepia, and have occasional obsolete purplish grey spots. They do not vary much in size, are narrowed at the end, and measure 1·5 in. by 1·1.

Adult ♂, shot 4th September 1861. Length $8\frac{1}{2}$ in.; wing $5\frac{3}{10}$; tail $2\frac{2}{10}$; the two central rectrices rather pointed, and

somewhat longer than the rest. Bill along culmen 1 in., to gape $1\frac{2}{10}$, black, purplish at the swollen base of upper mandible, and greenish ochre at base of lower. The basal half of the culmen is fleshy, and shrinks when dry, which makes the fore part of the bill much higher; but in fresh examples the culminar line in all *Charadriidæ* is much more nearly straight than would appear from ordinary drawings. Iris deep umber. Ear as large as the eye, round, operculum well exposed. The whole of the upper parts of the bird, and the sides of its breast more especially, are washed with a warm buff tint. Exposed tibia, to joint, $\frac{7}{10}$ in; tarsus $1\frac{1}{2}$. Legs greenish grey, yellower on the tarsi, and browner on the toes; claws deep brown.

121. Ægialites geoffroii (Wagl.).

Charadrius leschenaultii, Lesson.

Ch. fuscus, Cuv.

Hiaticula rufinus, Blyth.

This, the largest species of Ring-Plover known, was abundant on the sandy shores of Formosa. The stomachs of those I examined were lined with epithelia of a mud-colour, and filled with remains of small univalve mollusks and Crustacea. This species is at once to be recognized by its large size, its heavy bill, and by its having no indications of the white nuchal collar.

♀, shot 29th August 1861. "Length $8\frac{1}{2}$ in.; wing $5\frac{4}{10}$; tail $2\frac{4}{10}$, of 12 feathers. Bill blackish brown, ochreous flesh-colour at base of lower mandible. Inside of mouth flesh-colour; tongue blackish at tip. Eye large and blackish brown. Legs light yellowish grey, with a tinge of green; toes more leaden-coloured, with black claws."

122. Ægialites cantianus (Lath.).

Very abundant all the year round. Numbers breed with us. This species is very variable in the length of bill, as also in the intensity of the red and black of its nuptial dress. Some specimens also, during summer, become very much faded, some almost to albinism. *Ægialites nivosa*, Cassin, seems to me no other than this bird. Cassin's species was founded on a single specimen procured in California (see 'Birds of North America,' p. 696).

123. Ægialites philippinus (Scop.).

Charadrius curonicus, Bechs.

C. minor, Meyer.

This pretty little species, which has occasionally been shot on the British coasts, is with us a plentiful resident, and breeds on the sandy shores. In autumn, when the black facings of the nuptial plumage fade away, a strong touch of buff tinges the white of the head and neck. In this plumage I procured a pair on the 10th September 1861, and took down the following note on them:—"Length $6\frac{1}{2}$ in.; wing $4\frac{3}{10}$; tail $2\frac{4}{10}$. Bill blackish brown, brownish ochre on base of lower mandible. Iris dark umber; eye-skin brownish, tinted with yellow at the angles in the female, in the male a bright orange. Legs and claws clear yellow ochre; claws black. Inside of mouth pale bluish flesh-colour."

124. Hæmatopus longirostris, Gray.

125. Recurvirostra avocetta, L.

A few parties of both these visit the Apes' Hill Creek every winter.

126. Totanus glottis, L.

Adult, shot 4th September 1861. "Length $13\frac{7}{10}$ in.; wing 7; tail 3. Bill along culmen $2\frac{3}{10}$ in., to gape $2\frac{4}{10}$. Apical half of bill blackish brown; basal half leaden grey. Ear-covert as large as the eye, dark purplish grey; operculum an oval slit, running obliquely through more than half its diameter. Iris dark umber. Legs and toes light ochreous grey, patched with ochre on the toes, and dark leaden grey at their joints; claws deep brown. A few dark brown angular spots on the breast, which is otherwise white."

A winter visitant.

127. Totanus stagnatilis, Bechst.

Scolopax totanus, L.

Totanus horsfieldi, Sykes.

T. lathami, Gray.

T. tenuirostris, Horsf.

I procured only one of this species, on the 30th August 1861, out of a small flock on the mud-flats near Taiwanfoo. I have never met with the bird on the Chinese coast.

"♂. Length $10\frac{8}{10}$ in.; wing $5\frac{3}{10}$. Tail only partially moulted. Bill greenish black. Legs yellowish grey, with a tinge of green; claws black. Intestines 20 in. long; cæca $1\frac{1}{10}$ from anus, about $\frac{3}{4}$ long."

128. Totanus calidris, L.

Both this and the *T. fuscus* have been procured in North China. This I noticed in small parties on our mud-flats during early winter.

Adult ♀, shot 30th September 1861. "Length $11\frac{1}{2}$ in.; wing $6\frac{1}{10}$; tail $2\frac{1}{2}$, of 12 feathers. Bill, along culmen, $1\frac{7}{10}$ in. Exposed tibia $1\frac{2}{10}$ in.; tarsus 2. Bill, apical half black; basal half olive flesh-colour, the lower mandible having less of the olive than the upper. Inside of mouth light olive flesh-colour. Legs orange, somewhat greenish on tibiæ, and brighter on toes; claws black." A cluster of small eggs proved this specimen to be an adult female. From this I should fancy that it is usual for the species, after breeding, to lose the red tints of the bill, and to assume them again in winter, birds shot during the cold season having usually that organ so coloured.

129. Totanus glareola, Gmel.

Flocks abundant in early winter and spring, when they are passing on their migrations.

130. Totanus ochropus, L.

Sometimes on the coast, but more commonly scattered about the banks of inland waters and marshes in small parties or singly. I believe a few stay with us to breed.

131. Totanus brevipes, Vieill.

T. cinereus, Gray's 'Genera.'

T. glareola, Pall.

T. pulverulentus, S. Müller.

T. griseopygius, Gould, B. of Austr. vi. pl. 38.

Common on the large mud-flats near Taiwanfoo during early winter, passing southerly.

Adult, shot 30th August 1861. Length 11 in.; wing $6\frac{1}{4}$; tail $2\frac{8}{10}$, of 12 feathers. Bill blackish brown on apical half, greenish brown on basal half of upper mandible, greyish ochre

on lower. Legs and toes yellow ochre, washed with greenish grey; claws black. The specimens of this bird I dissected were very fat. "Proventriculus $\frac{9}{10}$ in. by $\frac{4}{10}$ at widest part; gizzard an irregular round, with moderately muscular lateral tendons, greatest diameter $1\frac{1}{10}$, depth $\frac{9}{10}$; epithelium thick and leathery, somewhat rough to the touch, widely and irregularly furrowed, and containing remains of a small Crab, of which the carapace and several legs were nearly entire. Cæca $1\frac{3}{10}$ in. from anus, right one $1\frac{6}{10}$, left rather longer, in thickness about $\frac{1}{10}$. Intestine $18\frac{1}{2}$ in. long; greatest thickness $\frac{3}{10}$. Tongue $\frac{7}{10}$ in. long, thick and horny, except close to the base, the lateral edges turned up, and the tip pointed."

This bird is a summer resident in Northern Japan, Kamtschatka, and the Aleutian Isles (Temminck), migrating for the winter to the islands of the Indian Archipelago. In its migrations it passes the coasts of China and Formosa in September and April. I have procured specimens at these seasons at Amoy; and in Formosa I obtained three adults in summer plumage, and three immature birds at the end of August and beginning of September. According to Cassin, it also occurs on the coasts of Western America. The plumage of this species, in the immature winter and summer dresses, has been well described by Schlegel in the 'Fauna Japonica.' The young bird is mottled on the dark parts of the breast and flanks, and freckled on the scapulars and wing-coverts, with whitish. It is in this dress the *T. pulverulentus* of Müller. In the summer plumage it is spotted on the throat, and barred irregularly on the breast and flanks with blackish grey. In the winter, the breast is of a uniform colour with the back. It is then the *T. cinereus* of Gray's 'Genera.'

132. Tringoides hypoleucus (L.).

An abundant resident species, though its numbers are greatly increased in winter by the arrival of flocks from the north. Adult, shot 3rd May. "Length $7\frac{8}{10}$ in.; wing $4\frac{3}{10}$; tail $2\frac{4}{10}$. Bill blackish, deeper at the tip, and more flesh-coloured towards the base, especially of lower mandible, with a slight bronze tint. Inside of mouth ochreous flesh-colour. Eye-rim very narrow

and black; iris very deep hazel. Legs yellowish grey, with an occasional tint of greenish; claws black."

133. Limosa uropygialis, Gould, B. of Austr. vi. pl. 29.

A few small passing flocks of this species usually occur on our coast in September and April. I procured no specimens in Formosa.

134. Numenius minor, Schleg. Faun. Japon.

Numenius minutus, Gould, B. of Austr. vi. pl. 44.

This species also occurs very late in spring and early in autumn, at the end of April and August respectively. It has been well figured in the 'Fauna Japonica' and 'Birds of Australia.'

♂, shot 29th April. "Length $12\frac{8}{10}$ in.; wing $7\frac{3}{10}$; tail 3, of 12 feathers; wings, when closed, reaching to $\frac{1}{10}$ in. of end of tail. Bill along culmen $1\frac{7}{10}$ in., from angle $2\frac{1}{10}$. Upper mandible somewhat curved; lower straight to $\frac{1}{2}$ in. from the end, when it suddenly bends downward. Bill blackish brown, flesh-brown at base of upper mandible, and pale ochreous flesh-brown for basal two-thirds of lower. Inside of mouth pale ochreous flesh-colour. Tongue $\frac{3}{4}$ in. long, shaped like a long pointed arrow-head, with the edges at the tip turned up; tip horny, the rest fleshy. Irides dark brown; eye-rim blackish brown. Naked portion of tibiæ $1\frac{2}{10}$ in.; tarsi $2\frac{2}{10}$, pale clayey flesh-colour, browner on the toes and semiwebs; claws blackish brown."

♀, of same date. "Length $13\frac{2}{10}$ in.; wing $7\frac{2}{10}$, reaching to $\frac{4}{10}$ in. of end of tail, which is $3\frac{1}{10}$ long." The gizzards of both these specimens contained numerous black weevils (*Curculionidæ*) and a few Coleopterous larvæ.

135. Numenius uropygialis, Gould.

This is the Eastern representative of the European Whimbrel, differing chiefly in having the rump barred and spotted instead of pure white. A native brought me a pair at Taiwanfoo on the 30th October; and from the accounts I have received I have reason to believe it breeds on the island. "Length 15 in.; wing $8\frac{1}{2}$; tail $3\frac{1}{2}$. Bill along culmen $3\frac{2}{10}$ in., to rictus $3\frac{3}{10}$; tarse $8\frac{3}{10}$. Bill and apical half of lower mandible blackish brown, somewhat fleshy in parts, the rest flesh-colour. Legs deep clear violet leaden; claws blackish brown."

136. Numenius major, Schlegel, 'Fauna Japonica.'

This species, which differs from *N. arcuatus* in having a longer bill and longer legs, frequents our shores in great abundance during winter, retiring northerly on the approach of summer.

137. Numenius arcuatus, L.

Flocks of these also visit the Formosan shores in winter, but not in such abundance as the last-named, *N. major*, which summers in Japan, and is easily distinguished from this species by its much larger and longer bill, and by its longer legs.

138. Numenius rufescens, Gould, P. Z. S. 1862, p. 286.

The single female specimen that I procured of this very rufescent species was shot on the sand-flat that divides the Tamsuy River, near its mouth. It had for some days been observed, in company with its mate, passing to and returning from its feeding-ground, the peculiar character of its long-drawn cry distinguishing it at once from the large species that visits these shores during the winter, the note more resembling the melancholy whistle of of the Grey Plover. From the developed state of its ovary and the late season of the year when observed, I have little hesitation in stating that it is a resident species. It differs from *N. major*, and agrees with *N. australis* of Australia, procured by me on the Peiho flats, near Peking, in having a striated rump; but it is much more rufescent than that bird, and we cannot do otherwise than regard it as a well-defined race, closely allied to the Australian Curlew.

♀, shot 8th April. "Total length 24½ in.; wing 12$\frac{7}{10}$; tail 4$\frac{8}{10}$. Bill to gape 7 in., blackish olive, tinted with flesh-colour, darker on the apical half; basal half of lower mandible light flesh-colour, tinged with ochre. Inside of mouth flesh-colour. Eyelid feathers white; skin round the eye blackish brown. Iris deep chocolate-brown. Ear-conch larger than the eye, round; operculum ovate and exposed. Legs leaden grey, blackened on the joints, webs, and sides of the toes. Tarsi 5 in. in length; claws blackish brown, with ochreous edges."

On dissection this bird proved to be a female, with large well-developed eggs and oviduct, evidently within a few days of laying, proving that its nesting-site could not have been far

distant. If this be a good species (and I am inclined to think it is), it strikes me as rather a strange fact that two species of true *Numenius* should be found indigenous to the same semi-tropical island, the smaller species, or Whimbrel, ranging over the southern portion, and the present species over the northern. *N. australis* was very abundant on the Peking marshes in August; but I have never met with it as a visitant in South China, nor yet has it been recorded from Japan. The present bird would appear to be a resident species; and we cannot help thinking that its differences from the typical *N. australis* may be due to its isolation and inability to interbreed with its near ally.

The only specimen I have of this interesting Curlew is at present in the hands of Mr. Gould. I must therefore extract his description of it from the 'Proceedings':—

"Head, neck, upper and under surface reddish fawn-colour, deepest and most conspicuous on the rump and tail-feathers; down the centre of each of the feathers of the neck and abdomen is a streak of blackish brown, which becomes broader and more conspicuous on the neck and breast; primaries blackish brown, strongly toothed on their inner margins with greyish white; tail-feathers irregularly crossed with blackish brown; thighs light buff."

I observe, on comparing my bird with a specimen of *N. australis* in Mr. Gould's collection, that mine has much thinner and fewer black streaks on the neck and breast.

139. Tringa cinclus, L.

T. alpina, L.

T. chinensis, Gray.

My specimens from Formosa vary considerably in length and curvature of bill, and proportions of legs; but the summer plumage, in which I procured several examples, proves them to be nothing more than the true European Stint. I may here remark that, owing to my specimens in winter plumage from China having been wrongly identified, I have entered this species in my previous lists as *Tringa subarcuata*. The true Pigmy Curlew has been found near Peking; but it visits rarely, if ever, the southern coasts of China; at least I do not recollect ever having

met with a white-rumped Stint. Flocks of Dunlins begin to arrive on our shores at the end of August: among these you frequently find adult birds in full summer plumage. The early flocks pass southwards, and are replaced by larger accessions from the north, and in the cold season the shore swarms with them. They feed chiefly, as the inspection of their gizzards testifies, on the small univalve mollusks left in the mud by the receding tide.

140. Tringa acuminata.

Totanus acuminatus, Horsf. Trans. Linn. Soc. xiii. p. 192.

Schœniclus australis, Gould, B. of Austr. vi. pl. 30.

I found this species very abundant on the marshes of Takoo (North China) in August. At the end of that month a few may always be discovered hurrying down our coasts southwards. They return to the north as late as May. On the 18th and 21st May I procured several specimens. These appear identical with the Australian bird. Length $8\frac{4}{10}$ in.; wing $4\frac{9}{10}$; tail $2\frac{3}{10}$. Bill 1; tarsi $1\frac{2}{10}$; apical half of bill purplish black; basal half olive-brown, with a tinge of flesh-colour. Legs yellowish olive, with black claws.

141. Tringa platyrhyncha, Temm.

Flocks of this bird were frequently met with on the south-west shores in September. Most of those I procured were in partial summer plumage, with more or less freckled breasts.

♂, shot 2nd September. "Length $6\frac{8}{10}$ in.; wing $4\frac{2}{10}$; bill along culmen $1\frac{2}{10}$. ♀. Length $7\frac{1}{2}$; wing $\frac{3}{10}$; bill along culmen $1\frac{3}{10}$. Bill blackish mud-green; inside of mouth dark flesh-colour. Tongue long, rather broad, and somewhat concave. A double row of inverted papillæ runs down the centre of roof of mouth, nearly its whole length. Legs yellowish grey, with dark leaden-grey tarsal joints and toes; claws black. Body abounding in fat. Gizzard oval, with moderate lateral tendons; epithelium very thin, of a dark mud-green stain, containing marine vegetable substances, with no pebbles or small stones. Intestines 18 in. long; cæca $1\frac{2}{10}$ from anus, about $1\frac{3}{10}$ long."

142. Tringa temminckii, Leisler.

A common winter visitant to the inland waters and marshes.

143. Tringa damacensis.

Totanus damacensis, Horsf. Trans. Linn. Soc. xiii. p. 192.

Tringa subminuta, Midd. Sib. Reise.

This is also one of the hurrying passers-by that run to winter in more southerly latitudes. It passes in September, to return in May. It is never to be seen in large flocks, nor are the flocks numerous. Indeed I may say that this is one of our rarest Snippits. I only procured one specimen in Formosa.

144. Tringa albescens, Gould.

Schœniclus albescens, Gould, B. Austr. vi. pl. 31.

This species is pretty numerous on our marshes in September, but leaves very shortly for more southern latitudes. It winters in the Indian Archipelago, whence Mr. Wallace has brought home numerous examples. In summer it retires to breed in Kamtschatka and Northern Mantchuria, passing the coast of South China hurriedly in May. I procured abundant examples of it in the south-west marshy lands of Formosa, but most of them were either immature or almost moulted into the winter dress. I have, however, five skins, procured at Amoy in May, in complete summer plumage.

Length $5\frac{8}{10}$ in.; wing $4\frac{3}{10}$; tail $1\frac{9}{10}$, the two central rectrices exceeding the lateral feathers by $\frac{4}{10}$ in. Bill $\frac{7}{10}$ in.; bare tibia ·47; tarsus ·73. Bill and legs olive-black. The two central rectrices exceed the one that succeeds by $\frac{2}{10}$ in.; the second feather $\frac{3}{10}$ in. longer than the three next, which are equal in length; the outermost feather is $\frac{2}{10}$ in. longer than these; the tail thus presents a very irregular tip. In its *winter* plumage the upper parts are light blackish grey, many of the feathers with dark centres more or less apparent; the feathers of the back, scapulars, and wing-coverts are more or less margined with white. Quills blackish brown, with white shafts; the primary coverts largely tipped with white, forming a conspicuous bar on the wing; secondaries tipped and margined with white, a bar of white running across their bases. Central upper tail-coverts and two central rectrices black, the latter edged with whitish; the next feather lighter, and the rest of the tail very pale brown, with white edges; remaining tail-coverts white. Axillaries pure white, the carpal edge being barred with black. Before the eyes

and all the under parts pure white; greyish on the sides of the breast. From *T. subminuta* this species can be distinguished, in every plumage, by the shortness of its toes, and from *T. temminckii* by the shape of its bill.

In summer the head, back, scapulars, and tertiaries become strongly edged with chestnut; and all the white parts of the face and neck, down to the breast, become fine chestnut rust-colour. The lower breast is sparsely spotted across with black, and a few black streaks occur on the flanks and lateral upper tail-coverts. In this plumage it has more affinity with a very differently shaped and larger form, the *T. subarcuata*.

All the specimens of this bird dissected were thickly coated with fat, as most migrating birds are. Their stomachs were roundish, compressed at sides, with strong lateral tendons, and contained remains of small shells, sea-weed, a few maggot-like worms, and minute stones. Intestines $12\frac{3}{4}$ in. long; cæca $1\frac{1}{10}$ from anus, left one $1\frac{3}{10}$ long, right one $\frac{9}{10}$, cylindrical, $\frac{1}{10}$ wide.

The small parties of these birds that visit our salt-marshes rise altogether, when disturbed, with a loud twittering note. When one is wounded, its companions fly round and about it to try and render it assistance, in the manner of Curlews, and often keep by the fallen until it dies, thus too frequently endangering their own lives. I have not observed this sympathy with the distress of its fellows displayed by any other species of *Tringa*.

145. Calidris arenaria.

Charadrius calidris, L.

Tringa tridactyla, Pall.

These also pass our coast early, and return late. Very few seem to remain on our shores the winter through.

146. Strepsilas interpres, L.

Arrives in small flocks, and departs about the same season as the Sanderling. I dissected a male, and found its trachea, before dividing into the bronchi, formed into a bony bulb about $\frac{2}{10}$ in. in diameter. Liver very large. Stomach containing only a few particles of sand. Intestine $18\frac{1}{2}$ in. long; cæca $1\frac{2}{10}$ from anus, about $1\frac{3}{4}$ long. Several white leech-like entozoa, $\frac{1}{2}$ in. long, occurred about the stomach and liver.

147. Lobipes hyperboreus, L.

I procured a specimen of this Phalarope, as it sat floating and washing itself in a little stream near Apes' Hill in November. It was in company with one other, which flew screaming away. I watched them for some time before I fired, and was much delighted with their pretty graceful movements. At Tamsuy I procured three examples, 14th March, out of a flock that were feeding on the shoals of our river. A few of these carried indications of the summer plumage, some of the feathers of the upper parts and neck being marked with red. "Length $7\frac{2}{10}$ in.; wing $4\frac{1}{2}$; tail $2\frac{1}{10}$. Under tail-coverts reaching a little beyond the tail. Bill black. Iris deep olive-brown. Legs exteriorly deep bluish grey, with black claws; interiorly yellowish grey, washed with deep leaden at the joints. Ear nearly oval, as large as eye, the skin of it elevated, showing the operculum on the lower part of the circle; the surrounding skin purplish grey. Inside of mouth flesh-colour, the tongue being finely pointed and bluish grey. Wings reaching to a little beyond the tail."

148. Scolopax rusticola, L.

Woodcocks are said to occur occasionally during winter on the hills. I have never met any; but there is no reason why they should not visit the island, as they are found pretty commonly about Foochow and in South China.

149. Gallinago scolopacina, Bonap.

Scolopax gallinago, L.

Gallinago uniclava of my previous lists.

150. Gallinago stenura, Temm.

I procured specimens of both these at Tamsuy in March. A few, especially of the latter, stay to breed in our marshes.

151. Gallinago megala, Swinhoe, Ibis, 1861, p. 343.

This Snipe I found abundant about the marshes on the road to Peking, in August and the beginning of September. In the latter month a few may always be found all down the China coast; but they do not remain long, evidently seeking much more southerly regions where they pass the winter, and not returning past our shores again till April. I fancy that the Great Snipe, procured from the Indian Archipelago, will consequently

be found to be of this species. They are not so large as European Great Snipe, but heavy Woodcock-like birds, with the tibiæ feathered almost to the joint. They generally occur singly, but I have put up two or three at a time. When flushed, they rise somewhat clumsily, with a loud cry, and hurry away with a low, almost straight flight. I procured a fine male specimen from the marshes near Taiwanfoo, on the 10th September 1861. "Length $11\frac{2}{10}$ in.; wing $5\frac{6}{10}$; tail $2\frac{1}{2}$, composed of 20 feathers, 10 broad central ones and 5 narrow lateral ones on each side. Bill along culmen $2\frac{1}{2}$ in., along edge of lower mandible $2\frac{3}{10}$; tarsus $1\frac{3}{10}$; mid-toe $1\frac{1}{2}$. Legs light yellowish grey, with blackish brown claws. Bill light yellowish brown for basal two-thirds, yellower on base of under mandible, blackish brown on apical third. Iris dark umber-brown. Ear placed directly under the eye, triangular; operculum quite exposed; skin of ear purplish brown. Rim round the eye the same. Inside of mouth ochreous flesh-colour. Stomach a long irregular oval, lined with a thin furrowed epithelium, containing one worm in a mass of mud-like indistinguishable matter. Cæca 2 inches from the anus, $\frac{2}{10}$ long by $\frac{1}{10}$ wide. Intestine 22 in. long, from $\frac{2}{10}$ to $\frac{4}{10}$ in thickness."

I have compared my specimens of *G. megala* from Peking, Amoy, and Formosa with the Australian Great Snipe (*G. hardwickii*) shot by Capt. Blakiston at Hakodadi, North Japan, and with another of the same species from Australia, from Mr. Gould's collection. The Australian bird is larger than ours, has a bill more spatulate at the end, like that of *G. scolopacina*; the tibiæ are bare to a greater extent, and the tail contains only sixteen feathers, of which the outermost is the only one much narrowed. The bill of our bird more resembles that of *G. stenura*, to which it also assimilates in the form of its tail.

152. Ibis nippon, Schlegel, Faun. Japon.

These birds are by no means regular in their visits. At the close of April, a small party of some half-dozen birds were frequently to be seen probing the mud of the river-shoals at Tamsuy. I was not, however, fortunate enough to procure an example. I do not think they breed on the island. The birds of the year are of a smoke-grey, deep on the head and neck, and nearly white on the wings and under parts.

153. Platalea major, Schlegel, Faun. Japon.

A pair or more of large Spoonbills were frequently to be seen, the winter through, on the Tamsuy river. From their size I take them to be of this species, but I did not obtain any specimens. I may here remark that a specimen I procured in Swatow, China, has no transverse grooves on the bill, and answers more nearly to the Great Spoonbill of the 'Fauna Japonica' than to the European species.

154. Ardea cinerea, L.

A. leucophæa, Gould, B. of Austr. vi. pl. 55.

A common resident species.

155. Herodias alba, L.

Ardea modesta, J. E. Gray.

Common in winter, and probably the year through, though I have no evidence of any breeding with us. This large white species in my Canton List was wrongly referred by the editor of the 'Ibis' to *H. intermedia.* The large Egret of South China is the *Ardea modesta,* Gray, which Mr. Blyth considers identical with *H. alba* of Europe.

156. Herodias garzetta, L.

A very common resident species, associating, especially in summer, in large flocks, and breeding in company in our bamboo- and other plantations. I procured, on the 14th March, a fine male in full plumage, of which I made the following note:— "Entire length 24¼ in.; wing 10¾; tail 3¾, of 12 nearly equal feathers. Upper mandible, edge and apical half of lower, black; the remainder of lower pale grey, becoming flesh-colour towards base. Cere pale greenish yellow; eyelid greyish blue and semi-transparent, the eye appearing through; the edges of the eyelids yellow, with an inner narrow edge of blackish. Iris clear light yellow, having an outer circle of golden, the whole bounded by greyish black. Inside of mouth flesh-colour, the tongue being yellowish, and the sides of the roof and the angle of rictus being yellow; the roof of upper mandible and the inside of the *crura* of lower black. Skin about ear smoke-grey; ear-covert roundish, about $\frac{2}{10}$ in. wide, the aperture occupying the semicircle nearest

the eye. Legs black, the toes clayey ochre, with a tinge of greenish; claws and the scutes adjoining black."

157. Herodias eulophotes, Swinhoe, Ibis, 1860, p. 64.

This species, which I first discovered and noted as a rare bird at Amoy, was pretty common on the Tamsuy river, being frequently seen in parties of four and five, and occasionally in company with the *H. garzetta*. They are never to be met with in very large flocks. They nest, in company with the common species, on the branches of trees; at least, I have watched them in the same heronries, though I have never succeeded in taking their eggs. In confinement they object to the approach of strangers, starting back and ruffling their feathers, and pecking with savageness at the hand put coaxingly forward. This and the *H. garzetta* feed almost entirely on fish, shrimps, and *Squillæ*; whereas the Yellowhead (*Buphus coromandus*) and all the *Ardetta* group are to a great extent omnivorous. I have kept alive most of the *Ardeidæ* that occur in China, and I have noticed that the Egrets would pine away unless small fresh fish were constantly supplied to them: they would not take flesh or bread as a substitute. All the others, *Ardea cinerea* included, would make a meal off bread and meat when fish failed. I procured both males and females of this species at Tamsuy. The female is a little larger, but they are not otherwise to be distinguished.

This Egret has a fine clear yellow bill in summer, becoming tinged with brown in winter. Its cere is tinged with green and purple; its irides light pearly yellow. Its legs are in summer black, in winter greenish brown; its feet and claws are greenish yellow. From *H. garzetta* it can at all seasons be distinguished by its light and shorter bill, and by its much shorter legs; but in summer its fine full crest marks it at once as different, as well as the scantiness of the dorsal plumes, which do not, as in that species, exceed the tail, and turn feathering upwards. It has considerably more affinity with *H. candidissima* of America; but that bird is of different proportions, and has a black bill and feet. This bird, in common with most of the Heron tribe, loses it crest early in August; and the other nuptial plumes are then much worn and scanty, and soon drop away. The breeding-season is then over.

158. Buphus coromandus (Bodd.).

It is my opinion that, under the term Russet Heron, two species are confounded, the one being found in South Europe and Africa, and the other in India and its archipelago, and, as a summer visitant, in China. Our Eastern bird can, even in its white winter plumage, be distinguished by the greater length of its bill, which is generally half an inch longer, and by its more naked tibiæ. In the summer plumage the distinctness is marked. The African has the crown of its head and its under neck only buff-colour, tinged with a vinaceous hue. In ours the entire head, neck, and breast are clothed with orange-coloured feathers, those of the breast only having a slight vinaceous tinge: the centre of the back is also orange; but the long loose dorsal plumes are light vinaceous pink. I see that the European form has been distinguished by M. Roux as a different species, under the term *Ardea veranii*, and that of Java by Horsfield as the *A. affinis*; but why multiply synonyms? *A. russata* has been applied by Temminck to the European bird, and *A. coromanda* is an old name for the Eastern form. All the specimens of undoubted European birds I have examined are alike, and are easily to be distinguished from the Asiatic, especially in summer plumage.

This species arrives in Formosa in April in very large flocks, which do not separate, but breed together, feed together, and remain in constant company till they leave our shores again in the beginning of October. They are very partial to insects, and may be frequently seen seated on the backs of and near cattle, catching the flies that swarm about them. I have found in their stomachs maggots, grasshoppers, and many other insects; but they do feed on fish when they can get them, though they are by no means such assiduous fishermen as many of their brethren are. They are much tamer than most Herons, and so are easily approached within shot. In confinement they soon become tame and docile, and will feed readily on almost any food offered. They often build in company with the Egrets and other Herons on the branches of trees, fighting and squabbling together, and robbing one another's nests of materials in much the same manner. The nest is merely a small flat pannier of twigs, on

which three eggs are usually laid. The eggs are bluish white, with a tinge of green, much lighter and rather larger than those of *H. garzetta*. In South China and Formosa this bird, as I said before, is only found as a summer visitant, wending southwards in winter, which season it doubtless passes in India and its archipelago, though I can find no note of that fact in any work.

Adult, shot 1st May. "Length 15 in.; wing $9\frac{1}{2}$; tail $3\frac{3}{10}$, square, of 12 feathers. Bill, lore, and eye-rim orange-yellow, the two latter covered with a thin powdery skin; region of the eye somewhat tinged with blue. Iris bright yellow. Inside of mouth yellowish flesh-colour. Tibia blackish at the top, the remainder, with the knees, greenish; tarsus and toes dark brown, and both obscurely washed with green, paler on the soles; claws blackish brown."

159. Butorides javanicus (Horsf.).

"*Ardea scapularis*, Wagl.," v. Schrenck.

This solitary, skulking, Bittern-like species is abundant in all marshy grounds throughout Formosa, a few also occurring in winter. It feeds by day, prowling about in the water-covered fields of paddy, searching for tadpoles, shrimps, and small fish, as well as for grasshoppers and many kinds of insects. At night it roosts on long reeds and bamboos, or on the branches of trees. On these I have seen it nesting. I procured one egg at Taiwanfoo, which is of a pale duck's-egg colour, 1·63 in. long and 1·25 broad. The young are more like the adult than is usually the case among the lesser Herons.

I procured two young examples in September. The dark green of the head is striped longitudinally with ochreous; the cheeks are also streaked. The under parts, instead of being a uniform greyish brown, are broadly streaked with that colour, ochreous, and white, which, however, blend into one another. A few of the feathers of the back, scapulars, and lesser coverts carry one spot of ochreous apiece at their tips. The colours generally are scarcely so bright as in the adult, but in other respects they are very similar. Iris clear yellow. The lore, edge of upper and basal half of lower mandible greenish yellow; the rest black. Legs and toes yellowish green, with blackish claws.

These birds are not easily scared. When observed, they

run behind a bank or among the reeds, trying to walk out of danger's way. It is only on sudden alarms that they take wing; they then do not fly right away, but drop at no great distance into the first cover.

160. Ardeola prasinosceles, Swinhoe, Ibis, 1860, p. 64.

Professor Schlegel, of Leyden, who is well acquainted with the *A. speciosa* of Java, and has the credit of being anything but a species-maker, agrees with me in considering this bird distinct from the Malayan form. I feel myself therefore the more justified in disagreeing with the opinions of such high authorities as Messrs. Sclater and Blyth, as expressed in this Journal (vol. iii. p. 52). The species of Squacco Herons will therefore now stand *A. comata* (Pallas) of Africa and Southern Europe; *A. leucoptera* (Bodd.) of India; *A. speciosa* (Horsf.) of Java; *A. malaccensis* of Malacca and the Deccan (*A. grayi*, Sykes); and *A. prasinosceles*, Swinhoe, of China. Our *Ardeola* is a constant resident in South China and Formosa, frequenting wet paddy-fields during the day, where they feed on grasshoppers and almost anything they can catch, and roosting at night on the banyan and other large trees. They are called *Tsan-la*, or Rice-field Herons, by the Chinese, and Paddy-birds by Europeans. They may often be seen together in the same field, as they are a common species, but they neither associate in flocks, nor breed in company. Their wicker nests are usually placed on the high branches of banyan trees; and their eggs, seldom exceeding three in number, are bluish white and rather large. The young birds are splashed with dusky on the wings, but they are otherwise very similar to the adult in winter dress. In September the summer plumage begins to fall away, and is replaced by the winter feathers, in which latter dress, as has been before remarked, the several species of the genus are almost undistinguishable from one another. In April the complete nuptial dress is again assumed. *A. speciosa* differs from our species in having a whitish head, neck, and occipital plumes, instead of these parts being of a bright brownish-red colour. In fact it is intermediate between the Chinese bird and the *A. malaccensis*, which has the head and neck yellowish grey, and the

back vinaceous pink, and not blue. *A. leucoptera* has the blue back, but the head and neck are pure white.

161. Ardetta flavicollis (Lath.).

Also a solitary species, and rather rare in Formosa. It frequents rice-fields, and places its nest on low bamboos. It is in habits a good deal similar to *Butorides javanica*, but I have not had many opportunities of watching it.

162. Ardetta cinnamomea (Gmel.).

This species is abundant enough in summer, a few only remaining the winter through. The adult plumage is dark cinnamon above, light yellowish cinnamon on the lower parts, the breast and belly having dark feathers, forming a median line. The young are dark brown on the upper parts, mottled and barred, on all but the head, with brownish buff. The under parts are buff, striped longitudinally with blackish brown. Quills and tail, in whatever plumage, cinnamon-red. The adult birds carry bars on their plumage often for years, so much so that a pure unspotted-plumaged specimen is almost a rarity. On a young bird, procured in August, I have the following note:—"Bill pale flesh-colour, light purplish brown on the culmen and sides of lower mandible; base of both mandibles, lore, and round the eye greenish yellow. Iris clear yellow. Inside of mouth flesh-colour. Legs greenish yellow, yellower on the under tarsus and soles, dingy on the toes, and brownish on claws. Middle claw, in this fledged youngling, has no pecten. Plumage Bittern-like, with brownish red wings, tufts of greyish down still adhering to many of the feathers. In yawning, this young bird expanded the crura of its under mandible."

The Cinnamon Heron rarely, if ever, flies up into large trees, generally preferring bushes, small bamboos, or the ground to roost on. It builds on low stations, and generally alone. It is a solitary bird, and never seen in company with any, except its mate. It is, like the other *Ardettæ*, not particular as to its diet, eating whatever of small life the rice-field yields.

163. Ardetta sinensis (Gmel.).

I only procured one of this species, and that was in April in Tamsuy. It would appear to be rare in Formosa. As a summer

bird it is particularly common in the marshes near Amoy, China. They are there seen, numbers together, scattered on the tops of the reeds and mangroves, each bird standing on a branch, often on one leg, with head sunk between the shoulders, the bill only moving as on a pivot, and describing a semicircle, as the bird extends its vision. They are tame, and not easily disturbed. If alarmed by loud cries, they flutter and drop quietly to the roots of the reeds. When they are made with difficulty to take wing, they never fly far. I have generally found them at Amoy in May, but could never ascertain where they bred, though the young, in mottled and spotted Bittern-like plumage (*A. lepida*, Horsf.), were common enough a little later in the year. This species is very similar to *Ardetta minuta* of Europe, of which it is the representative form in Asia.

164. Nycticorax griseus (L.).

I fully expected to find in Formosa the Red-backed Night-Heron of the Philippines, but was annoyed to discover that it was still our European friend that prevailed. This bird was building abundantly in the fine old banyans in the city of Taiwanfoo; and as my hunters shot them without mercy, I had opportunities of examining them in all three plumages—the spotted first-year, the light grey second-year, and the adult, with all manner of transitional stages. The iris is at first greenish yellow, gradually changes to brownish straw-yellow in the second plumage, and then deepens and changes to the clear pink vermilion of the mature bird. The bill of the adult is black, with yellowish edges to basal two-thirds of gonys. Lore at base of bill grey, greenish near and round the eye. Pupil horizontally ovate, expands in the dark and at death to nearly full extent of the eye, which projects much. The legs of immature birds are green; in the second plumage they are strongly tinted with yellow ochre on the under tarsi and soles, and often more or less grey throughout. In the adult they become a uniform orange-ochre, the claws always being black.

In summer, when the young require incessant feeding, it is not unusual to meet the Night-Heron abroad during the day, searching for food; but at other seasons it is strictly a night-bird,

roosting in daylight in company, among osiers or bamboos, on the banks of inland waters, and rambling about in the twilight and darkness of night in search of food. In the darkest nights their loud *kwa* may be heard as the birds are winging their way overhead. The Chinese call them *Am-kong cheow,* or bird of darkness, and look upon them with superstitious dread. They are thought to have some connexion with evil spirits; and as it is the Chinese custom to propitiate the evil demons, that they may not play any of their mad pranks on humanity, so they give protection to these their birds. In large cities superstition is laughed down, and not so prevalent; we therefore, in the Formosan capital, were not thought to commit any great sin in disturbing the ill-hallowed bird; but among the country-people at Tamsuy, the villagers for miles round would flock to us when we were out with guns, and beg us not to disturb a colony of Night-Herons that had commenced nesting-operations in a fine bamboo-grove. This plantation of tall bamboos, mixed occasionally with longans and other trees, was on a hemp-farm of some four acres, which it entirely encircled. The flock of Night-Herons, about 200 or more in number, showed themselves about this wood for the first time in March. For a fortnight they merely made it their roosting-site for the day. In April all was excitement, fighting and building; and towards the middle of the month many of the birds were laying. In the first few days of April a large colony of Egrets (*Herodias garzetta*) came to the same trees; and about the middle of the month a large flock of Yellowheads (*Buphus coromandus*). At first the confusion was very great, the flocks of the several species coming into constant collision; but before the end of April all seemed amicably arranged, and you could often see on the same tree several nests of the three distinct Herons, the females of each sitting, and the males standing by to protect. This large mingled heronry was a most interesting sight; and many times on a fine evening, I have taken boat and crossed over to the Heron-farm to view it. The farm-house stood at one end of the plantation; and its inhabitants were always courteous and kind, and allowed me to roam about their grounds as I pleased. A small wood of large trees stood close to the cluster of huts, and these

a party of Grey Herons (*Ardea cinerea*) had made their home; and here and there among the bamboos you could observe a few of the Yellow-billed Egret (*H. eulophotes*). Thus, within the precincts of these few acres, one had the opportunity of watching and comparing the habits of no less than five interesting species of Herons. Few naturalists, I fancy, could ever have had such an opportunity as this; but my time was short, and I was obliged to leave the country before the *A. cinerea* and the *H. eulophotes* had commenced laying. The bamboos were mostly 30 or 40 feet high, bending and curving in all directions, and on almost every available spot throughout their quivering lengths the wicker nests were placed. As you made your way through the dung-stained herbage underneath, clouds of all the several species rose from the trees above, and hovered about the air croaking and screaming. As soon as you had stalked on a few paces, the birds alighted again on their respective positions, and continued their avocations as before. The bamboo is too unstable a tree to trust one's weight to at the height required to be reached for the nests, and they were moreover covered with prickles. I was therefore obliged to look to the dark-leaved evergreen, the Longan, for eggs. Out of one of these I procured several eggs of three species, the *B. coromandus*, the *H. garzetta*, and the *Nycticorax*. There were always three in each nest. The eggs of the Night Heron were the largest and greenest; those of the Yellowhead pale bluish, almost white, and finer grained; those of the Egret smallest and bluish green. I have seen many heronries in different parts of China and Formosa, but none that I ever saw were so large or so excitingly interesting as the one on the Tamsuy river. It was a sight not easily to be forgotten.

165. Gallicrex cristatus.

Gallinula cristata, Latham.

G. plumbea, Vieill.

G. lugubris (male) and *G. gularis* (female), Horsf.

This was not a rare bird on the rice-fields and marshy tracts near Taiwanfoo in summer, and I procured both birds and eggs. It is of shy and Crake-like habits, running with velocity through the damp grass and rushes.

♂, in summer. "Length 16 in.; wing $8\frac{4}{10}$; tail $3\frac{4}{10}$, of ten feathers. Bill bright yellow, washed, on the upper mandible chiefly, with light greenish. Frontal crest $1\frac{4}{10}$ in. long, and with the loral space coloured vermilion. Inside of mouth flesh-colour. Rim round the eye deep brown; iris bright chestnut. Legs greyish leek-green, greyer on the tarsal front, and paler on the soles; claws brown."

♀, brought alive, 12th August (caught off nest). "Length 13 in.; wing $6\frac{1}{2}$; tail $2\frac{1}{2}$, of ten feathers, somewhat graduated. Bony crest and base of culmen fleshy wood-brown, rest of culmen brownish; bill light greenish yellow, flesh-coloured on gonys, and yellow at edges. Inside of mouth flesh-coloured; tongue fleshy, furrowed down the middle, very gradually narrowing to the tip, which is obtuse, horny, and setaceous. Iris deep yellowish hazel; eyelids ochreous brown. Ear small and round, operculum quite exposed. Legs and toes light dusky yellowish green, with a wash of grey; claws brown."

Its nest consists of a pile of rushes and flags, placed at the roots of growing rushes in the marsh, and contains usually from seven to eleven greenish cream-coloured eggs, blotched and spotted with cinnamon-red. Many are, however, almost entirely washed with a strong cinnamon-colour, blending the blotches together. Length 1·75 in.; breadth 1·25.

The dissimilarity of size, as well as of colour, in the sexes of this bird has led many of the older naturalists to consider them distinct species. It is distributed, according to Blyth, throughout India and the Malay countries. In South China it is not an uncommon summer visitant.

166. Porzana fusca, L.

P. erythrothorax, Schlegel, Faun. Japon.

Abundant about Taiwanfoo. It lays over seven eggs, on a reed-formed nest at the roots of rushes. The eggs vary in ground-colour from nearly white to deep cream, and are sparsely spotted and freckled with cinnamon-red and light purplish grey. Their average dimensions are 1·2 in. by ·85; they are in some cases attenuated at both ends.

167. Gallinula phœnicura.

Rallus phœnicurus, Pennant.

G. javanica, Horsf.

These birds were not uncommon about Taiwanfoo in summer, and at Tamsuy I procured several examples in March; but I cannot be sure as to their spending the winter in Formosa. In South China they are, I believe, birds of passage. Their eggs vary in shade of cream ground-colour, and are spotted and blotched, in some cases only freckled, with cinnamon-red and light purplish grey. Length 1·65 in.; breadth 1·15.

168. Gallinula chloropus, L.

G. parvifrons, Blyth.

The European Water-hen is found on most inland waters in Formosa; but I did not obtain the Coot. I procured a male and female off a large pool near Apes' Hill. Legs yellowish green; irides brown.

169. Rallus striatus, L.

R. gularis, Horsf.

A live female of this Rail was brought to me on the 27th July, at Taiwanfoo, with seven eggs; she had been caught on the nest. The eggs are of a pinkish cream-colour, varying in shade, sprinkled with purplish grey, and blotched with Indian or cinnamon-red, especially at the larger end. They are, for the most part, rounder than the eggs of Gallinules. Length 1·3 in.; breadth 1.

♀. "Bill bright madder-pink on basal two-thirds, light violet-grey on apical third; culmen dark. Iris yellowish chestnut. Inside of mouth pale pink. Ear small, roundish, and exposed. Legs dusky leaden grey, tinged with greenish and brown."

The male is a very little, if at all, smaller than the female, but has brighter bill and legs; in other respects they are similar. The hind necks of our Formosan birds, as well as of specimens from Siam, are bright chestnut. This colour scarcely shows at all in birds that I have seen from India; but specimens may vary in this respect, and I have seen no large series. Mr. Blyth considers the Malayan and Indian birds to be the same.

170. Larus crassirostris, Vieill.: Bp. Consp. p. 212.
L. melanurus, Schlegel, Faun. Japon.

This is the first of the Gulls that arrive at the mouths of our rivers and on our shores. After severe N.E. winds, numbers of the two following reach us; but of all three species, young birds bear a large proportion to those in adult plumage.

171. Larus niveus, Pall.
L. kamtschatkensis, Bp. Consp. p. 224.
L. canus major, Middend.

172. Larus cachinnans, Pall.
L. fuscus of my Amoy List, Ibis, 1860, p. 68.

173. Chroicocephalus kittlitzii, Bruch.

This small black-hooded Gull is at once to be distinguished by its thick, heavy black bill. It frequents our rivers in flocks in winter, flying up stream when the tide retires, and feeding upon the exposed shoals.

174. Chroicocephalus ridibundus (L.).

A few of these occur occasionally in company with the last, but they are comparatively rare.

175. Hydrochelidon indica (Steph.).
Sterna hybrida, Pall.
S. leucopareia, Natterer.

This species, distributed throughout Asia and its islands, and known to British ornithologists by the name of the Whiskered Tern, was not uncommon on the marshy lands of S.W. Formosa. I have not yet noted it in China, though doubtless it must occur there. A fine male, brought to me 28th August, had the bill deep brownish lake-red; legs and toes Indian or madder-red, with black claws. Its stomach contained several large larvæ of a water beetle (*Dytiscus,* sp.) and a few small fish. Intestines very thin, 16 inches long, and devoid of cæca.

The Black Tern of S. Europe, *H. nigra,* L. (*S. fissipes,* Pall.), wrongly referred in my Amoy List (Ibis, 1860, p. 68) to *H. javanica,* Horsf. (a species common throughout China), did not occur in Formosa.

176. Sternula sinensis (Gmel.).

S. sumatrana, Raffles.

The true Little Tern, *S. minuta* (L.) is not an uncommon winter visitant to the south coast of China, and occasionally comes to our coast during that season. But in Formosa we have a resident species quite distinct, with constant dark bill and legs, and grey on the upper tail. I have several skins of this species, procured in *summer* at Taiwanfoo; so that there can be no doubt of the plumage not being matured. These I have compared with the American *Sternula* and the Australian *S. nereis,* Gould, but both these are much more closely allied to *S. minuta.* There are, however, specimens in the East Indian Museum, marked *S. minuta,* from the Indian Archipelago, which appear to me identical with our bird. These have been noted by Raffles as *Sterna sumatrana.* Four adult specimens were brought to me on the 29th August. They all varied in the length, colour, and even shape of the bill. In one the bill was a uniform blackish brown; in two others the bills were of a brownish-yellow ground-colour, washed over with black; and in the fourth the apical half was blackish grey, and the basal half brownish ochre. The legs and toes of this last were light reddish brown, with orange under-tarsi and soles, the claws being blackish brown. The other three had ochre-brown legs and toes, with more or less orange on their under-surfaces. In none of my nine specimens is there any mottling of immaturity, and most of them have the tail-feathers much worn. The stomachs of those dissected contained small shrimps and a few small fish. Intestine 12 inches long; cæca situate $\frac{8}{10}$ from anus, about $\frac{2}{10}$ long. Length of bird 9 in.; wing $7\frac{1}{4}$; tail 4, well forked, the four central rectrices being short and obtuse, the four lateral on each side pointed and graduated outwards, the outer one being $1\frac{7}{10}$ in. longer than the central. Crown, nape, and loral streak black, leaving the forehead, a partial eyebrow, and the moustache-streak white. All the under-parts pure white. Upper parts, including rump and central rectrices, pale French grey. Primary quills with white shafts; the first two black, with broad white borders to the inner webs; the next two blackish grey, with narrower borders; the rest of the same colour as the back. Secondaries tipped with white. In

the winter plumage the black on the crown and lores fades away, leaving only a nuchal band from one eye round the hind neck to the other eye.

When I visited the rocky coast of E. Formosa in 1857, I noticed vast numbers of these birds breeding on the precipitous sides of the cliffs. At that time I wrongly mistook this for the Lesser Tern, which is a bird of more northerly climes, that seeks our shores only in winter.

Since my arrival in England, I have received specimens of this bird from Hankow (Central China). One of the skins is that of a very young bird, and proves that the species breeds also in that locality.

177. Sternula minuta (L.).

A winter visitant to the shores of Formosa.

178. Sterna cristata, Steph.

S. pelicanoides, King.

S. velox, Rüppell.

A large colony of this widely distributed Tern has bred for years on a small island, called Kelung Island, three miles to seaward of the north harbour of Kelung. When at Kelung, in H. M. S. 'Inflexible,' in 1857, large numbers of their eggs were brought to us by fishermen. They were not bad eating. These eggs varied a good deal in colour and markings; but Baron R. K. von Warthausen's able description and figure in the 'Ibis' (1860, p. 127), of some procured in the Red Sea, leave me little to say about them. This bird is common all the year on the north coast, uttering loud hoarse screams as it flaps past.

179. Sterna caspia, Lath.

A few visit the coast from the northern latitudes in winter, after severe north-easterly winds.

180. Anoüs stolidus, L.

In the harbour of Sawo, on the N.E. side of Formosa, a few of these Terns were breeding on the cliffs. One flew into our boat, and was knocked down by a sailor. Another was brought to me alive. In our voyage round the island, I frequently saw parties of them crossing and recrossing our wake, evidently searching for food in the troubled water that the steamer's pad-

dles stirred up in revolving. They always kept a long distance in rear, and made no attempt to board us. Their long wings enable them to skim the surface of the water with great ease and grace.

181. Diomedea brachyura, Temm.

This is the large Albatros of the China Seas, being seen in more or less abundance on every voyage. They travel as far north as Japan. I have never discovered their building-site, though, from their being found at all seasons, I suspect the island or islands are not distant from the south coast of China. The young of this species, of a uniform blackish brown, has been figured in the 'Fauna Japonica'; but its legs are there represented as of a flesh-colour, and its bill pinkish, whereas American writers state that both bill and legs in the living young are brownish, changing to black after death.

The Albatros on wing is never figured correctly. When flying, the wings are curved like the head of a pickax, and it skims the surface, rising and falling with every trough of the sea, with scarce any motion perceptible in the wings, except at their tips. They often sail upwards, and continue in their flight, throwing first one shoulder forward and then the other. In the male of this Albatros, the bronchi, on leaving the trachea, bulge considerably as they run horizontally, then contract and bend forwards and downwards, and lastly, turning sharp round, rise upwards and bulge again before entering the lungs. In the female they are short and simple, without convolutions.

182. Diomedea nigripes, Aud. Orn. Biog. 1839, p. 327.
D. fuliginosa, Gmel., of my Amoy List, Ibis, 1860, p. 67.

This small species, at once distinguishable from the Sooty Albatros, or Cape Hen, by its black feet and the absence of the pale line along the bill, is the representative of that species in the North Pacific and China Seas. Cassin in his 'American Ornithology,' for some unaccountable reason, has confused this species with the black young of the preceding large form. This bird is abundant in the Formosan channel at all seasons. The male is a good deal larger than the female, has a longer and larger bill, and is of a uniform sooty brown, without the white round

the bill, about the eye, and on the belly of the other sex. In this species the trachea of the female is simple, but that of the male is terminated by large, swollen, convoluted bronchi. In a male specimen, procured in May, the bronchi ran down right and left, almost straight, for about $1\frac{7}{10}$ in., then took a bend forward for a short space, and narrowed, and lastly, bending inwards and upwards, bulged largely, and entered into the lungs. The proventriculus consisted of a large flabby sac, about 3 inches in length, and $1\frac{3}{10}$ in breadth in the broadest part, lessening to $\frac{1}{2}$ in. before it reached the stomach, which was round and muscular, $\frac{8}{10}$ in. in diameter, and supported by strong circular lateral tendons with radiating muscles. Both the stomach and the proventriculus contained a thick greenish-yellow juice; the latter was stocked with remains of fish, and the former with numbers of small gritty stones, some as much as $\frac{3}{4}$ inch in diameter. In both these were numerous small, thin *Ascarides*. Intestine 8 feet long, and strong, averaging $\frac{3}{10}$ in. in thickness.

I kept four of this species, and two of the *D. brachyura*, alive for some days in my verandah at Amoy, but could not get them to feed. The first few days they used to walk about in a clumsy manner, but afterwards they got weaker and could not manage to rise. Both species had a common habit of stretching the neck and raising the bill upwards, uttering at the same time a loud, hollow-sounded, moaning bellow, as of some animal in pain. The production of this sound seemed to force up oily matter into the mouth, for the birds would go through the movements of swallowing for some time afterwards. Through the day, and often in the night, this miserable moan would be uttered at set intervals. I kept one of this species alive, to see how long he would live without food, and he lived on, week after week, without showing any particular signs of weakness, till about the 20th day. He then began to look shaky, but still obstinately refused to eat fish. On the 29th day he died: but his abstinence from food was in reality greater than that extraordinary number of days; for he had been in the possession of the fishermen who caught him nearly a week before he came to me. When fresh taken in the spring, the birds are particularly fat: but this starved specimen had survived on the gradual absorption of his adipose

tissue; for when I dissected him, his flesh was quite hard and dry, with scarce any signs of fat about any part. Birds of prey, and most birds that wander far and seek a precarious living, can survive a long while without food; but I never before heard of such an extraordinary power of abstinence as these Albatroses have proved themselves to possess.

183. Colymbus septentrionalis, L.

C. glacialis of my Amoy List, Ibis, 1860, p. 67.

In the winter several of these birds visit our coast from the north. Very few show any indication of the red throat, nearly all being in the winter plumage. This is the only species of Diver I have observed in Formosa.

184. Podiceps minor, L.

P. philippensis, Bonn.

I have a goodly series of Little Grebes, both from Formosa and China, and find them in every way inseparable from the European species. In summer plumage they appear to be identical, many Formosan specimens, like many English specimens, having the under-parts white, and many again washed with blackish. In my opinion they are one and the same. The Dabchick is an abundant resident on the inland waters of Formosa. Other Grebes doubtless visit our coast in winter, but none fell under my observation. I extract a note on an adult male, shot at Taiwanfoo 29th August 1861:—Length $10\frac{3}{10}$ in.; wing 4. Bill black, with a whitish tip. Loose skin at the base, rictus, and intercrural membrane of lower mandible pale greenish yellow. Inside of the mouth light bluish flesh-colour. Iris straw-yellow. Legs blackish grey, with a slight tinge of green.

185. Phalacrocorax carbo (L.).

Pelecanus sinensis, Shaw.

This species is not uncommon on our rocks and those of South China during winter. In early spring they assemble in flocks and repair southwards. They are tamed, and employed by the Chinese to catch fish, as every one has read. In a state of domestication they are subject to variations in plumage like most domestic animals.

186. Phalacrocorax bicristatus (Pall.).
Carbo violaceus, Gmel.
C. bilophus, Brandt.

This is an inhabitant of Kamtschatka and Japan, and has been ably described and figured in the 'Fauna Japonica.' Occasionally during winter a specimen gets blown down to our northern coast, but it ought hardly to be numbered among the Formosan birds.

187. Querquedula circia, L.

A male of this Teal was brought to me alive on 13th March at Tamsuy. "Bill light olive-brown, blackish brown underneath, on the edge round and on and about the dertrum. Iris burnt sienna. Legs ochreous grey, with browner webs and claws." It is a brightly tinted specimen. The whole of the belly is deeply stained with orange-ochre, as I have before observed in specimens of *Q. crecca* shot at Amoy. This was the first time I met with this Duck in China. Our other Ducks are the following:—

188. Querquedula crecca, L.

189. Querquedula glocitans, Pall.

190. Querquedula falcaria, Pall.

191. Mareca penelope, L.

192. Dafila acuta, L.

193. Anas boschas, L.

194. Anas pœcilorhyncha, Pennant.

195. Spatula clypeata, L.

196. Tadorna vulpanser, Flem.

197. Casarca rutila, Pall.

198. Fuligula marila, L.

199. Fuligula cristata, Ray.

200. Clangula glaucion, L.

201. Mergus serrator, L.

There are, doubtless, other species comprised in the immense flocks of *Anatidæ* that spread down our shores during winter.

None, however, as far as I am aware, stay to breed. Geese and Swans I did not observe; but most certainly some species of these also come to us, as they descend to much lower latitudes on the coast of China. I may here remark that a Black Scoter Duck, shot by Capt. Blakiston on the Yangtsze, turned out to be the American Black Duck (*Œdemia americana*, Swainson), and not the European *Œ. nigra* as one would have expected. I have never met with this Duck, and have not, therefore, included it in my list.

XXXIII.—*A Visit to the Islet of Filfla, on the South Coast of Malta.* By Charles A. Wright.

Starting at 7 A.M., on the 16th of May last, with two friends, in a go-cart from Sliema, on the north side of Malta, we reached the sea-side opposite Filfla at about half-past nine o'clock A.M. Filfla is an isolated rock, less than half a mile long, and scarcely a quarter broad, situate on the south coast of Malta, some three or four miles off the shore. On our way from Sliema to the sea-coast, we saw a great many *Corvus monedula*, the only sedentary representative of the Corvine family in Malta. I thought I recognized two or three *Corvus frugilegus*, but, owing to the distance, was not quite sure. The Rook is a bird of passage here, arriving in autumn, and sometimes staying the winter and part of spring. I noticed it this year, beyond all doubt, as late as the beginning of April. It generally leaves long before that time, probably to find a suitable breeding-country further north. In the fields by the roadside several Common Buntings and Short-toed Larks were breeding, and a few Swifts were chasing insects in the higher regions of the air. A Turtle-Dove, a Spectacled Warbler, and several Spotted Flycatchers caught our view as we drove along, and every farmhouse had its colony of noisy Sparrows (*Passer salicicola*). The Spectacled Warbler (the only indigenous Warbler of the island) is also now breeding. On nearing the cliffs on the southern coast, we again fell in with our friends the Jackdaws in great numbers. They appeared to have nests or young ones, as several of the old birds were carrying something in their mouths. A pair of Blue Thrushes (*Petrocincla*